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The Role of the State in Reducing the Major Risks of Offshore Oil and Gas Operations: The Santa Barbara Channel and Santa Maria Basin as a Case Study

Senate Subcommittee on Offshore Oil and Gas Development

California Legislature

SENATE SUBCOMMITTEE ON
OFFSHORE OIL AND GAS DEVELOPMENT

Gary K. Hart, Chairman

Interim hearing on

THE ROLE OF THE STATE IN REDUCING THE MAJOR RISKS OF OFFSHORE OIL AND GAS OPERATIONS: THE SANTA BARBARA CHANNEL AND SANTA MARIA BASIN AS A CASE STUDY

University Center
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EXECUTIVE SUMMARY

Ms. Diane Guzman, director of the County of Santa Barbara Resource Division, gave an overview of present and projected offshore oil and gas production in the Santa Barbara Channel and the Santa Maria Basin. Production will rise from the present 80,000 barrels per day to 500,000 barrels per day or more in the 1990s. An estimated 2,000 exploratory and production wells will be drilled from an estimated 35 new oil platforms in Federal and State waters. There will be one consolidated marine terminal and four consolidated processing sites. (See Exhibit "A" for a map of these projects.)

There has been much local participation in the project review process. Over $12 million has been spent on this. Policy issues studied are pipeline transportation, consolidation of facilities, and air strategy. Systems safety and reliability studies address the risk situation. The joint review panel procedure has brought together expertise from Federal, State, and local government.

Mr. James Trout, of the State Lands Commission, described the regulations, inspection and licensing procedures, and educational programs that the Lands Commission uses to prevent the occurrences of oil spills. When weather conditions are severe, the Commission mandates that critical operations on platforms in State waters will be shut down. Studies are presently being done on systems safety, but lack of funds has stopped inspection of offshore terminals.

Senator Marks asked how the Commission complies with Section 8574 requiring that oil vessel operators file an oil spill contingency plan. No clear-cut answer appeared.

Mr. Tom Dunaway, of the Minerals Management Service, outlined the jurisdiction of that agency over Outer Continental Shelf oil operations. Production in the OCS will increase, reaching a peak of 354,000 barrels per day in 1990 to 1992. Best available and safest technologies (BAST) are mandated on oil platforms to prevent or ameliorate blowouts, spills, and fires. Periodic inspections are made without advance notice. The platform verification for Federal water programs was described, and the inspection program shared by the Department of Interior and the Coast Guard was outlined. Since the 1969 blowout of Platform A, over 500 wells have been drilled in the region with only 100 barrels spilled.

Mr. Don Cornett, of Exxon USA's Western Production Division, presented an analysis of the protential risks involved in offshore oil operations. Exxon believes there will be consolidated processing facilities in both the south and north regions of Santa Barbara County. Most of the oil produced will leave for refining in Los Angeles and Texas by pipeline. The only marine terminal will be a new, but seldom used, one in Las Flores Canyon.

Accidental oil spills of a few barrels are uncommon events in offshore oil operations. Major oil spills are extremely unlikely, occuring once in 4,100 to 11,000 years. He described the levels of response to oil spills. At Platform Hondo, Exxon has produced over 56 million barrels of oil and spilled only 5.

The likelihood of spills caused by tanker transportation is rare or unlikely according to Exxon's analysis. Statistics showed that after the passage of the Port and Tanker Safety Act in 1978, spills from water carriers and pipelines have decreased.

Mr. David Anderson, president of Get Oil Out, testified that GOO has now the safe development of offshore oil as its major concern. Spills continue to happen in spite of improved safety procedures, stricter regulations, and improved training. There will always be spills as long as the human element is involved. He described the effects and costs of a tanker platform collison, similar to those which have taken place in the Gulf of Mexico.

GOO recommends more stringent liability laws and more effective equipment for cleanup. Vessel traffic in the Channel should be regulated and limitations should be placed on the number and location of rigs in the Channel.

Mr. Bruce Lee, coordinator of Santa Barbara County Emergency Services, described the County's program to identify the plan for the risks of offshore oil operations. Jurisdiction and coordination are the major problems in such planning.

Captain Edward Grace, chief of Marine Safety for the 11th Coast Guard District, discussed the Coast Guard's response in all waters off Southern California. Overall contingency plans have been set up, but not detailed plans for every pollution incident. Each incident may have unpredictable events and plans must be flexible.

The Coast Guard is the Federal on-scene coordinator in charge at all oil spills. The spiller, if identified, should respond first and bear the costs.

Captain Grace was asked if the vessel traffic lanes should be extended to the West around Pt. Conception and if Clean Seas can effectively contain oil spills in open water. He replied that the lanes could not be extended completely because of the lack of visual aids, and that weather and sea conditions could make oil containment equipment ineffective.

Colonel George Cudd, of Vandenberg Air Force Base, pointed out that the Air Force has no jurisdiction offshore and no capability to respond to an offshore accident. It can provide helicopters to help such accidents, and its hospital facilities could help.

Chief Richard Peterson, of the Santa Barbara County Fire Department, said the County's strong concerns are with low frequency, high magnitude events. Fire response plans call for an oil industry-funded fire station at Gaviota and a fireboat.

The only capability for dealing with a large oil fire is in San Francisco and Los Angeles. They are not local and may not respond to local concerns. Santa Barbara County does not have the authority, jurisdiction, or capability to deal with the problems.

The California Oil Spill Response plan gives the California Department of Fish and Game authority as the coordinating agency in oil spills. Captain Edward Simons of Fish and Game described how the Department uses that authority and the decisions it must make. The Director of Fish and Game is the chairman of the Interagency Oil Spill Committee.

Fish and Game rehabilitates organisms damaged in oil spills. There are three sites on the coast for cleaning birds and otters. Money is needed to equip these facilities. SB 686 and SB 959 could

provide funds to study the effects of dispersants and oil on marine organisms.

When asked about the Puerto Rican episode, Captain Simons mentioned that Emergency Services was quickly notified and soon a dozen State agencies worked on the accident. The State had limited authority in the incident until a shift in coast currents brought the oil into State waters and coastal regions. Birds had to be cleaned and oil picked up. There were not enough people to do all the work. Jurisdictional roles were well-coordinated.

Captain Vince Agapedo, of the Santa Barbara Fire Department, said that governmental agencies do not have the capability to deal with large oil fires. Private companies known as Hell Fighters must be called in. They are specialists in fighting oil fires.

Boots and Coots is such a group. In the event of a severe oil fire, on or offshore, they could be on-scene with men and equipment in 16 to 24 hours. Private industry Hell Fighters are some of the best firefighters in the world. However, the County should not depend entirely on such professionals because they may not be available when needed. The public and local officials must make some hard decisions on how much risk they can accept and how much they will spend to prevent and mitigate those risks.

Marie DeSantis, formerly in the fishing industry and presently an author and writer for The National Fisherman, expressed the view that the technology does not exist to pick up spilled oil in the conditions often found in the open seas. She reported that Mr. Clean, a state-of-the-art cleanup vessel supported by the oil companies, recovered only one percent of the oil spilled in the Puerto Rican and could not work on the open seas in the conditions present.

Dr. Michael Herz, of the Tiburon Institute of Environmental Studies, spent a year studying the Puerto Rican incident. (See Exhibit "E" for an executive summary of that study.) The Puerto Rican exploded on October 31, 1984, outside the Golden Gate. Towed out to sea, the vessel broke in half near the Pt. Reyes Marine Sanctuary. The stern sank and is still leaking oil; the bow was safely brought into San Francisco. Thirty-five thousand barrels of oil were spilled.

As a result of his study, he recommended increased fire-fighting capabilities, more compatible oil pickup equipment, better understanding of coastal current regimes and designated areas in which to tow disabled boats. Industry should pay for the research and equipment needed to realize this recommendation. Dr. Herz was surprised that the Santa Barbara Channel, long an oil-producing region, was so vulnerable to oil-related accidents. Many of the recommendations made for Northern California apply to the southern regions also.

Councilman Archie Snow, representing the Southern California Association of Governments, stated that the Association is vitally concerned about the risks of oil transport. Pipelines do present risks of fires and spills. It is difficult to read and evaluate the technical jargon used in the EIS/EIRs on the pipeline projects.

Mr. Bud Waage gave the history of Clean Seas, a consortium founded in 1970 and supported by 16 oil companies. Although the likelihood of a significant spill today is extremely remote, every effort must be made, using the best available technology, to deal with such an eventuality. Clean Seas was created to do this.

The boats of Clean Seas, Mr. Clean I, and Mr. Clean II must be capable of recovering oil in 8- to 10-foot seas and 20-knot winds. They are also rapid response craft which can deliver containment booms to a spill in a very short time.

Drills are held at least twice monthly and are monitored by government agencies. The Coast Guard and the Minerals Management Service evaluate the industry's ability to contain and clean up oil spills. Woodward-Clyde has evaluated the ability of Clean Seas to deal with offshore oil spills.

Clean Seas has reached the upper ability to mechanically contain spills. Research is now being conducted on methods of chemically and biologically dealing with spilled oil.

Mr. Tim Rochte, of the California Conservation Corps, described the resources the Corps can provide in case of emergencies. In one to four hours, the Corps can provide personnel and tools to help clean up oil spills. They have responded to three large oil cleanup operations in the last five years.

Susan Hansch, of the California Coastal Commission, was concerned about the risks of offshore oil and gas operations. The Commission requires that offshore oil facilities mitigate all risks, and it supports equipment and training to do this.

Equipment must be upgraded. Oil spill containment and cleanup equipment is effective only in fairly calm seas. The accumulated risks of offshore drilling and tankering must be evaluated and acceptable thresholds and risks established.

Suzanne Rogalin, also of the California Coastal Commission, gave the statistics of 38 ship platform collisions from 1969 to 1979. Statistics can be interpreted in different ways. For example, the chances of a vessel explosion in port are given as once in 80 years. However, there were three explosions in U.S. ports in the last few years.

Best measures to prevent oil accidents involve training, inspection and equipment. Local fire departments must inspect facilities and acquire equipment such as fireboats. Legislative action should strengthen and enforce safety standards.

Mr. Maurice Scherb, a consultant on marine safety, stated that management must be made responsible for safety. Modern technology can provide data banks and black box recorders to monitor performance and catch problems on ships and platforms before a disaster happens. Rather than adjusting completed projects, the philosophy should be to improve initial design.

Carmen Pizzariello testified regarding CAORF (Computer Aided Operations Research Facility) which has operated since 1976. Its equipment can simulate any vessel in any location. By modeling the movements of ships and simulating the perspective of the vessel captain, data can be obtained that can determine the levels of risk involved. Safer procedures for vessel handling and vessel traffic control can then be designed.

Mr. Gordon Cota, a Santa Barbara fisherman, reported that the American Flag vessels encountered in the Channel have well-trained professional crews. The big problem is that of foreign vessels with no English-speaking crew members. He pointed out that the best technology does no good if human mistakes are made.

Mr. Jerry Aspland, of Arco Marine, recommended a strong organization of terminal operators,

merchant marine, and local government to set up operating procedures and environmental protection. Existing legislation and regulations are sufficient. The key is enforcement and cooperation.

Technology exists to meet the requirements of safe marine transportation. The human element is the unpredictable part of the system. Good people must be continuously trained.

Dr. Jean-Louis Armand, chairman of the Department of Mechanical and Environmental Engineering at UCSB, told how Norway, in the last decade, has become the leader in the study of advanced offshore technology. A levy on offshore oil produced supports the work of groups such as Det Norske Veritas. They establish standards for the construction, operation, and inspection of offshore oil structures. He suggested that a similar group, drawing on the expertise of the University of California, be supported in this region by government and industry.

Senator Hart, Senator Marks, and Professor Armand discussed the taxing mechanism used in Norway to support their research. There is some timid support for such work in this country, but more should be done.

A statement by Professor Marshall Tulin, of the Ocean Engineering group at UCSB, was then read. He recommends that a Center of Expertise be established in the State of California to study the risks of offshore oil operations. He believes it is important to conduct such studies before accidents happen.

Dr. Floyd Tuler, of the Mechanical Engineering Department at Worcester Polytechnic Institute in Massachusetts, discussed the use of risk analysis in the management of offshore oil operations. It can help set policy and establish priorities. Conflicts can be resolved.

Risk analysis is not a panacea for management of oil operations. It has limitations and, being based on probability, it is different from most conventional engineering analysis. It is a useful tool for identifying and mitigating hazards.

Mr. Clair Ghylin, of Chevron Oil Company, took the position that we have enough laws and regulations governing exploration and production in the OCS. He recommends more coordination and cooperation between industry and all levels of government to insure that those regulations work effectively.

He described the large number of permits that must be obtained before starting offshore oil operations and the time and money involved. The situation is ongoing and volatile and much analysis is necessary. Voluntary cooperation using existing methods is to be preferred to new legislation.

Senator Hart, Mr. Ghylin, Mr. Trout, and Mr. Dunaway discussed training and certification for offshore oil workers.

Mr. Robert Sollen, of the Sierra Club, called for the streamlining of existing procedures, not the creation of additional requirements. Putting many conditions and regulations on paper does not guarantee their effectiveness. What is needed is a joint powers agreement among existing agencies that could cross jurisdictional lines. There are now three sets of authorities dealing with the region from coast to open seas.

Ms. Marty Blum, of the Santa Barbara League of Women Voters, pointed out that the present case-by-case planning process is part of the problem. It does not allow for long-range consideration

of the cumulative impact of offshore oil operations.

The League recommends that planning for accidents be thoroughly coordinated by the authorities involved. The Coastal Commission should be funded and local air quality must be maintained.

Four members of the general public addressed the Subcommittee.

Mr. Horace Pennington, of World Oil Products, described a hydraulically operated valve to close the drill stem. Present valves operate manually and might not close in time to prevent an accident.

Mr. George Silva, a consultant in emergency planning, discussed the nature of risks and the need for comprehensive all-encompassing risk analysis of offshore oil operations. He recommended that some oil-generated revenues be committed to such a comprehensive analysis that would benefit coastal communities, the entire State, and the oil industry.

Mr. Michael McDermott, who holds a 2nd mates license in the U.S. Merchant Marine, gave some insights from the standpoint of a professional mariner who has sailed on West Coast tankers.

The human element is still the key factor. If men are tired and stand watch too often for too long sessions, they are more prone to make mistakes in judgment. The human element enters into decision making in accidents. A mariner is not going to incur salvage and tow expenses that may cost him his job if any alternative seems possible. Expensive safety procedures are frowned on by coast conscious management.

It is often difficult to use ship-to-ship radio effectively to prevent possible collisions. Traffic lanes must be extended past Pt. Conception and safety zones must take into account the maneuvering abilities of oceangoing vessels.

Spills are often not reported and dishwashing soap is used to disperse them. Bilges and tanks are pumped out at sea.

He recommended a Santa Barbara port authority that would deal with the problems of the Santa Barbara Channel roadstead. It would give better regulatory control and permit effective inspection.

Dr. Geoffrey Chung, of the UCSB Environmental Health and Safety Office, commented on disaster planning. The campus, because of its unique proximity to oil operations, is exposed to potentially severe accidents such as fires, air pollution at toxic levels, and oil on its beaches. There should be properly coordinated contingency plans to deal with such accidents.

Senator Hart thanked his colleagues on the Committee and the hearing participants. He summarized the major issues that emerged during the hearing: Jurisdiction is a problem. Who is in charge at an accident and who makes the decisions? National and international bodies are involved and communication and coordination with them must be established.

How are existing regulations to be enforced? There must be better understanding of what is being implemented and what conditions are being imposed.

The Subcommittee is concerned with funding of the Coast Guard and with research on the risks of oil operations.

The sea lanes around Pt. Conception should be extended and fire prevention and firefighting capabilities must be improved.

The Puerto Rican incident must be carefully studied for insights as to what happened and what steps should be taken in this region to prevent such disasters.

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9:15 a.m. Senator Gary Hart called the hearing to order. He welcomed members of the Legislature and thanked the hearing organizers.

Present at the hearing table with Senator Hart:

Senator Milton Marks, San Francisco

Assemblyman Jack O'Connell, Santa Barbara

Senator Dan McCorquodale, San Jose

Mr. Barry Schuyler, Lecturer, Environmental Studies Program, University of California at Santa Barbara

Mr. Jerry Seedborg, Consultant to Subcommittee

CHAIRMAN GARY HART: Oil and gas development by its very nature is a hazardous activity with inherent risks such as spills, fires, and escaping gases; and too often, legislative bodies only get involved with such issues after there is an accident or problem. Today we will try to gather information from a broad group of participants and experts as to how we can best prevent such accidents from occurring and how to deal with them should they ever occur. We're looking for recommendations for the State of California to help insure the safest possible environment in which oil and gas development can occur. Certainly here in this area we have seen a dramatic expansion in activity in the Santa Barbara Channel by both the Federal Government and new lease sales proposed by the State Lands Commission. We're hoping today to utilize the Santa Barbara Channel and Santa Maria Basin as a case study as to how these problems can and should be addressed.

Session I

An overview of oil operations in the region for the next 25 years: Risks and consequences of accidents.

Panelists: Diane Guzman - Santa Barbara County Department of Resource Management
James Trout - State Lands Commission
Tom Dunaway - Mineral Management Service (MMS)
Don Cornett - Exxon, USA
David Anderson - Get Oil Out, Inc.

MS. DIANE GUZMAN: This is a summary of offshore activity in Santa Barbara County and a review of existing development, proposed development, local review process and the manner in which risks are assessed. Santa Barbara has had offshore oil development since the 1880s with wooden platforms offshore Summerland. In 1929, we had the first leases in State waters; in 1958, the first offshore platform, Hazel; in 1969, the now famous oil spill; and since 1982, an unprecedented amount of offshore oil projects. Existing facilities are show on the overhead. We currently have 19

platforms in Federal waters and 7 platforms in State waters, 3 marine terminals, 5 onshore processing facilities, a current production level of about 80 million cubic feet of gas and 80,000 barrels of oil per day. Next I'll overlay the proposed facilities.

We have an additonal 5 platforms in Federal waters with another 15 theoretical, depending upon actual production numbers; another 5 platforms proposed in State waters; plus additional ones if there is re-leasing. We have planned for and approved 1 consolidated marine terminal, 2 consolidated processing sites on the south coast. We are planning for 2 consolidated sites in the North County and 420 million cubic feet of gas and 500,000 barrels of oil per day at the peak. So you can see that we have a large amount of proposed activity.

The time schedule: We have been in the permitting phase, and still are in the permitting phase, for several projects since 1982. These are only the major projects. Actual construction won't start until 1986, the earliest date for any production to come on-line in 1988 and 1989. We have done the permitting and planning, but there is still time for additional factors to be built into these projects.

The Santa Barbara County review process can be summarized with a couple of statements. First, we have a very aggressive local participation, and we have spent over $12 million in the processing of permits and doing major studies. We will have had 20 major projects to review, and we have participated with the Federal Government and State Government in joint review panels, so the major studies have been done with both Federal and State participation. In each of the projects approved by the County, there have been extensive conditions; in many cases, over 150 comprehensive conditions per project. Many of these address the risk situation.

Some of the major policy issues we have addressed are pipeline transportation, consolidation of facilities, and air strategies. Among the risks that we have studied are geology, air quality, marine biology, freshwater and terrestrial biology, fishing and offshore uses, system safety and reliability. The $12 million spent on these joint Federal and State studies has been from the government, and does not include monies from the oil companies.

Under the heading of geology, we have looked at site selection, consolidation of facilities, structural design including platforms, pipelines, on and offshore facilities, pier and loading areas, grading requirements, and slope restructuring.

Under air quality, we have studied the issue of pipeline transportation and found it to be beneficial from an air quality point of view. We've asked for the best available control technology, grid power; we have studied the air basin and asked for the minimization of onsite generators; we have limited the activities to those essential for production.

Marine biology: spill response, vessel traffic corridors, limited the use of chemical cleanup agents, spill forecasts, consolidated moorings, no construction during whale migration and efforts to re-establish kelp beds.

Terrestrial and freshwater biology: pipeline inspections, spill contingency plans, avoidance of sensitive habitats, air monitoring, slope stabilization, replanting, and erosion control.

Fishing and offshore usage: minimize offshore production, response time and re-establish kelp beds; recognize offshore traffic lanes and the need to remove construction scars.

System safety and reliability: We studied fire stations and fireboats, required onshore navigational aids, weather surveillance and forecast stations, pipeline transport of hazardous waste by-products, and limiting human exposure to areas of substantial risks (e.g., relocation of the Vista Del Mar School).

Conclusion: Santa Barbara County has found successful the following points: We need aggressive local role in review of large local projects. Even though our role is to review the onshore facilities and the permits associated with those, we have expanded that substantially. Joint review panel is a substantial improvement and brings the expertise of Federal, State and local governments together. Extensive studies have required comprehensive conditions, enforcement, and monitoring programs, and periodic updates as we learn more about risk situations and project development.

CHAIRMAN HART: What is the time frame for peak production? Answer: 500 thousand barrels per day by 1992 or 1993.

MR. JAMES TROUT: The State Lands Commission has always operated on the premise that an oil-related accident can occur; and since its inception in 1938, the Commission has been active in preventing accidents and developing rules and regulations coupled with onsite inspection.

In the Santa Barbara/Ventura area, production is declining at 10 percent per year; from 40 existing leases, 25 are currently producing. We have 19 development and exploration leases. In the next 25 years, we will see the resumption from some of the leases that are not now producing, and the releasing from 5 parcels that were formally leased and quitclaimed back to the State. During the next 20 years we also see the development of the Pt. Conception to Pt. Arguello eight tracts that were proposed in 1982 to 1983 and were since suspended. We need to recognize the areas where accidents and risks are highest. This includes the exploration from drill ships, platforms, seaport completions, onshore processing facilities, marine tanker terminals and pipeline.

In 1982, the Commission took the position that the best way to combat a spill was to prevent it from occurring. This has been done through regulation and control, inspection and enforcement. At critical times, operations are shut down such as when weather and sea conditions make oil spill containment and recovery equipment ineffective, or transportation is hampered, or when there is no oil spill containment or cleanup vessel available. There are times when critical operations are not performed at times when weather is not conducive.

The regulations we've adopted contain information on drilling operations, blow-out containment, supervision and training of spill cleanup personnel, platform and individual well safety systems, oil spill cleanup equipment, contingency plans and onsite containment plans, testing and inspection of blow-out prevention equipment and production safety systems. Safety requirements for working in an H_2S environment and daily monitoring of drilling and remedial well work.

We have been working on adopting one set of regulations so we operate in State waters under one set of regulations rather than two.

The Commission has been on the leading edge of system safety and control for over 40 years with onsite inspection and testing, with field inspectors, full engineering and geologic review, proposed marine terminal safety program and operated it for three years, training manual written and

adopted for terminal operators and required for all State-leased terminals. We've had a terminal inspection program which was not authorized by the Legislature after the Federal funding for the Coastal Commission expired and is not in effect at this time. No one is now inspecting those, and we currently don't have authorization to inspect them. This is one area that the Senate Subcommittee might want to look into. We do system safety and analysis for which the Legislature granted us money, for this fiscal year, to take an initial step in production safety. We are now working on future terms such as with the lease sale proposed in 1983 that includes cleanup and containment equipment; funded oil spill drills for the State and Federal agencies involved in these drills; a full-time wind, weather, sea state and temperature data collection, such as Diane mentioned, and studies on the effect of geo-seismic activities on whales and sea otters and fish eggs and larvae. That is an overview from what we see at this point, and the role that the State has taken in preventing the harm that can come from an oil accident.

CHAIRMAN HART: How often do platforms close down in the event of bad weather? Has that occurred in this area, and how often does it occur?

MR. TROUT: I can't answer that, but maybe Mr. Don Everitts, who is in our extracting development program, can answer that.

MR. DON EVERITTS: We have not done it yet, but the regulations are posted on the platforms.

CHAIRMAN HART: What is the criteria for a platform to shut down?

MR. EVERITTS: If seas are too high, or we can't test or bring materials out. No testing at night until procedures are satisfactory.

MR. TROUT: Critical operations are not done, such as removing drilling bits from holes, drilling in close proximity to other holes, or after holes.

SENATOR MILTON MARKS: Are you familiar with Section 8574 dealing with oil spills? Section 3 describes procedures to be followed by anyone who owns or operates a vessel engaged in transport of petroleum products in the territorial waters of this State. Procedures must be established and an oil spill contingency plan written that will reasonably prevent an oil spill occurring from oil transport operations in the territorial waters of the State. If a spill does take place, the contingency plan must deal with mitigating measures. This oil spill contingency plan must be approved by the Secretary of the Resources Agency and any such vessel operation who fails to file an approved oil spill contingency plan is guilty of a misdemeanor. Now how do you comply with these sections?

MR. TROUT: This act applies to the Department of Emergency Services, but I'd be happy to check that out and get back to the Committee.

We require contingency plans for our marine terminals and offshore platforms, by our leases, as well as statutes.

SENATOR MARKS: You should look at this Section because it's existing law, and I don't think it's being complied with.

CHAIRMAN HART: We do have the Office of Emergency Services on our next panel, so maybe they will want to comment.

SENATOR MARKS: Mr. Trout, what have you found out as a result of the questions that I have asked you?

MR. TROUT: The Section you referred to concerns oil spills and was originally put into the law at the time that very large crude carriers were being contemplated for marine transportation. It authorizes the Governor to create a State Oil Contingency Plan, involving the State Lands Commission, Resources Agency, Department of Oil and Gas, Department of Fish and Game, and Office of Emergency Services; and they have been working with the various companies to establish a Statewide Oil Spill Contingency Plan and plans for each individual oil operation plan, both marine terminals and platforms. I hope that answers your question.

SENATOR MARKS: I'm sorry, that doesn't. The law says: You must file an oil spill plan. Anybody who transports oil without such a plan approved by the Secretary of Resources Agency or designee is guilty of a misdemeanor. That's the law. Are you complying with the law?

MR. TROUT: To the best of my knowledge, we are complying with the law through the State Oil Contingency Group which is established in the Resources Agency which involves all the agencies that I mentioned.

SENATOR MARKS: You received from each oil company an indication of what oil they're going to transport, yes or no?

MR. TROUT: We have a contingency plan for each State platform and each marine terminal that's on State water.

SENATOR MARKS: You're really not answering my question. It says an oil spill plan must be filed. Now, is an oil spill plan filed?

MR. TROUT: Under the Oil Spill Plan, the State operating authority in charge is the Department of Fish and Game. It's always been our policy that the local government is in charge of the scene's operations, and State and Federal people support them.

SENATOR MARKS: What did you do in the Puerto Rican incident? What activity did you take? The Puerto Rican incident, for those of you not in Northern California, was a very serious loss of a ship and a lot of oil.

MR. TROUT: Senator, I'm sorry, I'm from the Los Angeles office, and I am not familiar with the activities up there.

MR. TOM DUNAWAY: Good morning, Senator Hart and members of the Subcommittee on Oil and Gas Development. I am the regional supervisor for field operations, Pacific OCS Region, located in Los Angeles, California.

The Outer Continental Shelf Lands Act and amendments of 1978 authorize the Secretary of the Interior to administer the provisions of the Act pertaining to the leasing of the OCS and may at any time prescribe and amend such rules and regulations as he deems to be necessary and proper to provide for the prevention of waste and conservation of natural resources. Additionally, ... the Secretary shall cooperate with agencies of the Federal Government and the affected states. The Secretary has delegated his authority to the MMS. For OCS operations off California, Oregon and Washington. MMS responsibility is carried out by the Pacific OCS Region in Los Angeles, and two

district offices in Ventura and Santa Maria.

I would like to speak on two areas: first, give an overview of OCS oil and gas operations for the next fifteen years; and second, highlight of MMS's responsibility for minimizing risk, preventing accidents, and dealing with accidents on the OCS.

The OCS is the outer continental shelf, and that is the lands three miles on out.

In addressing what activity will be taking place in the next fifteen years or so in the Santa Barbara Channel and Santa Maria Basin, we have analyzed current activities, proposed activities, and potential or hypothetical activities based on our current knowledge and current leasing.

Currently, all OCS operations are in Southern California. There are, in the Santa Barbara Channel and Santa Maria Basin, 12 platforms and 1 offshore storage and treatment vessel in full operation, with 3 platforms currently being installed. Production averages currently 80,000 barrels of oil per day. There are 2 mobile drilling units working in the Santa Maria Basin, and currently none in the Santa Barbara Channel.

Proposed activities include plans of development for 8 platforms that have or will be shortly submitted to the MMS for review. These platforms will be installed over the next five years to 1990, with production in 1990 estimated at 354,000 barrels of oil per day from the OCS.

The level of hypothetical activity is just a guess. However, our educated guess takes into account the current success or failure of exploration activities and future leasing activity in Southern California. Based on these factors, our more optimistic scenario is an additional 12 platforms by 1995, with production reaching 326,000 barrels of oil per day.

In summary, what we see as the activity in the OCS is:

1985	16 platforms	80,000 barrels of oil/day
1990	28 platforms	354,000 barrels of oil/day (peak 1990-1992)
1995	35 platforms	326,000 barrels of oil/day
2000	35 platforms	164,000 barrels of oil/day (app. $\frac{1}{2}$ of 1990 peak)

Exploration activity would remain fairly constant at between two and four drilling vessels working at any given time in the Santa Maria Basin and/or the Santa Barbara Channel.

The MMS has a broad and complete arsenal of laws and regulations, orders, and personnel to minimize risk and prevent accidents in OCS operations. OCS Lands Act as amended mandates the Secretary of the Interior in Section 21 to require the use of the best available and safest technologies (BAST), and in Section 22 to enforce safety and environmental regulations; specifically to schedule onsite inspections of all safety equipment designed to prevent and ameliorate blowouts, fires, spillages, or other major accidents, and periodic inspections without advance notice. Additionally, in Sections 21 and 22, the Secretary of Interior and the Secretary of the department in which the U.S. Coast Guard is operating are given authority to promulgate regulations and investigate accidents.

The MMS has promulgated, in 30 Code of Federal Regulations, Part 250, entitled Oil and Gas and Sulfur Operatons in the OCS, requirements for leases, procedures for accident investigations, and remedies and penalties for lease violations. Next, the MMS has issued specific OCS orders that go into great detail on what safety, design, equipment, testing, and maintenance must be used by

operators in the OCS. These are very similar to what Mr. Trout gave for the State Lands Commission.

We have one more significant area, and that is a platform verification program. All platforms in California must undergo this third-party platform verification.

CHAIRMAN HART: Are those platforms both in State and Federal waters?

MR. DUNAWAY: This is just a Federal program.

CHAIRMAN HART: We have no platform verification requirements within State waters?

MR. TROUT: I'm not sure what you mean by platform verification.

MR. DUNAWAY: Our platform verification program is three parts. It covers the design of the platform, the fabrication of a platform, and the installation of a platform. The companies submit to the MMS a recommendation of an independent third-party expert in one of these areas. That expert then goes onsite and monitors and reviews either the design, fabrication, or installation of our platforms, prepares a report which is then submitted to the MMS. We have our own experts who review that report to see what indeed the design, fabrication, or installation of the structures are in accordance with appropriate standards.

CHAIRMAN HART: So, Mr. Trout, to your knowledge there is no such for program for the State?

MR. TROUT: Well, we do have some activity. I'll ask Tom to respond to that.

MR. DUNAWAY: These orders also reference accepted industry standards, as API's recommended practices, National Electric Code, American Society of Mechanical Engineers' standards, and many more. Additionally, MMS issues safety alerts as a quick way of informing operators of accidents or of potential unsafe acts.

To tie this all together, the MMS's Pacific Region has 14 inspectors utilizing three helicopters who are in the field inspecting 365 days a year. These men, who average more than fifteen years of oil-field experience, inspect every OCS operation at least every two weeks or sooner, and visually witness and record the operations of every safety device. Platforms may have over 1,000 such safety devices.

As I previously stated, the Department of Interior and the U.S. Coast Guard (USCG) have shared responsibilities and safety regulations and accident investigations to promote safety, avoid duplication, and less burdensome regulations. The Department of Interior and U.S. Coast Guard have signed a memorandum of understanding effective December 18, 1980.

Briefly, the USCG is responsible for the design of floating facilities, personal safety, and has the lead in death and injury investigations. The MMS is responsible for design of fixed structures, and drilling and production systems, and has the lead in fire and explosions investigations. In the Pacific OCS, the MMS and Coast Guard have an excellent and cooperative working arrangement.

In 1969, the only significant accident (in the Pacific OCS) occurred: the Santa Barbara blowout. Since that time, over 500 wells have been drilled, 300 million barrels of oil have been produced, with only 100 barrels spilled. Last year only 10 barrels were spilled, with $9\frac{1}{2}$ cleaned up, and over 30 million barrels produced. This remarkably good record is due in part to the myriad of regulations,

MMS inspections, and the industry's dedication to safe operations. The MMS, the industry, the State, and the public want nothing less than the total commitment to safe, accident free operations.

MR. DON CORNETT: Thank you, Senator Hart, members of the Subcommittee. I am Don Cornett, Environmental Conservation Manager with Exxon's Western Production Division. I appreciate this opportunity to present our overall view of future oil and gas operations in the Santa Barbara Channel and the Santa Maria Basin.

My presentation will address the potential risks of these operations and safeguards and controls being taken by the regulatory agencies and the industry to mitigate these concerns raised by all interested parties. These concerns have been raised by projections of the future of offshore development in Santa Barbara County, which you've heard about already this morning. (See Exhibit "B" for Mr. Cornett's full statement.)

MR. DAVID H. ANDERSON: I am David Anderson, President of Get Oil Out. I should like to read a prepared statement. (See Exhibit "C" for the full statement from GOO.)

Session II, Part A

Who has the jurisdiction for dealing with such accidents? What is the coordination and communication between industry and all levels of government? Who has the resources, makes the decisions, and bears the cost?

Hearing Participants:

Bruce Lee - Santa Barbara County Emergency Services Coordinator
James Alexander - Regional Manager of Region I, State Office of Emergency Services
Captain Edward Grace - Chief of Marine Safety, 11th Coast Guard District
Colonel George Cudd - Environmental Task Force, Vandenberg Air Force Base
Chief Richard Peterson - Santa Barbara County Fire Department
Edward Simons - Department of Fish and Game

MR. BRUCE LEE: The potential problem for on/offshore emergency is serious. We work with other departments to identify risks from fires and building hazards. We also hire consultants to identify risks. Our measures include:

1. Developing emergency operation plans to utilize our best available options and develop comprehensive plans.
2. Performing large-scale exercises and evaluations before and after the plan is adopted to identify concerns, roles, communications, technical aspects, and how to respond.
3. Reviewing oil industry's plan and interface it with the County's plan to identify all perceived risks and make sure oil companies are capable of responding.

There is a need for better definition of on/offshore responsibilities in regards to offshore

emergency response. There is a need to assess how much we rely on State offices such as OES.

CHAIRMAN HART: What's the worst case scenario? Does it deal with jurisdiction or technology?

MR. LEE: Jurisdiction is our greatest problem; coordination and assuming roles in both drills and actual emergencies is risky.

CHAIRMAN HART: Does the State need to take more control?

MR. LEE: The State's excellent. We need to have them define more roles.

MR. JAMES ALEXANDER: The State OES has a small but important role in the event of oil spills. There is a warning control system in Sacramento, from which we notify the appropriate state and local agencies. The Department of Fish and Game is actually the lead state agency in case of oil spills.

CAPTAIN EDWARD GRACE: The 11th Coast Guard District is responsible for pollution prevention and pollution response in Southern California. The elements of doubling the number of rigs and increasing tanker traffic, expected groundings, fires, and spills have all become important, and the Coast Guard will have involvement in all of these activities.

This morning I will limit my remarks to pollution response, because the Coast Guard will always have an active role in this. Our jurisdiction comes from the Federal Water Control Act, where the Federal Government developed the National Contingency Plan, which is a joint effort between the EPA and the Coast Guard with an understanding between the EPA, Coast Guard, Minerals Management Service, and several State agencies. However, the Coast Guard is responsible for coastal areas because we are the agency with preassigned Federal on-scene coordinators who are responsible for pollution incident response.

On each level in the response community are jurisdictional matters that are generally spelled out in contingency plans. The first of those contingency plans is a national contingency plan. There are regional plans for each Federal region; and in each of these, on-scene coordinators are responsible for coordinating local plans. Each plan spells out a coordination procedure for communications, relations with industry, and for any other government agency that would be involved. This ranges from State agencies to local county and city organizations. We do not have plans or describe in detail what lockstep reactions have to be in a pollution incident. Each plan has to protect against unpredictable events. Any oil spill response always shows that that is the way a plan should be written. These plans also recognize an important point that the spill belongs to the spiller; the government is only here to provide that the cleanup is accomplished. Therefore, spillers are required to respond first; the Coast Guard is basically a first-aid responder. The type of spill that generally is assumed is a very large spill; tanker traffic, grid failures, etc. First-aid response could never be designed to stop these kinds of spills, only to keep them under control until something can be done.

Who is in charge? As stated below, the Coast Guard is responsible as the Federal on-scene coordinators to be in charge. In our position, we should monitor an industry's cleanup. If that doesn't happen, we take charge in cleanups. In that same act, we would not be involved with our own equipment; rather, we would contract it out, except for our National Strike Team.

Who pays the bill? The spillers, if known, will be required to pay the bill for the cleanup. Otherwise, the $311,000 fund out of the Water Pollution Control Act would have to be used. I am not free to coment on the status of this fund.

SENATOR MARKS: What effects will Federal Budget cuts have on your ability to operate?

CAPTAIN GRACE: There will be severe restrictions, the size to be determined after cut.

CHAIRMAN HART: Are the shipping lanes mandatory, rather than advisory? Should we extend the Western shipping lanes?

CAPTAIN GRACE: They are advisory. The effort to extend the lanes was modified six miles shy of initial request because there are no visual aids at that end of shipping lanes.

CHAIRMAN HART: To what extent are you familiar with the Clean Seas controversy, that wave action makes Clean Seas ineffective?

CAPTAIN GRACE: That's a physically difficult work space; containment equipment isn't as effective.

SENATOR MARKS: What is the frequency of these rough conditions?

CAPTAIN GRACE: Outer waters with 6-foot-plus seas occur 60 percent of the time or more.

COLONEL GEORGE CUDD: Vandenberg Air Force Base has no jurisdiction offshore; therefore, no particular requirements nor any capabilities to respond to an offshore accident or incident. We do have mutual aid agreements between our fire departments and the County fire departments and hospitals; but our firefighting is geared to a large aircraft-type fire, or a structural or wildland fire. We have no capability to respond to a ship or offshore-type situation. Our hospital is a 45-bed facility, and care there would be limited to stabilization of patients, as agreed with County disaster plans. We have three helicopters with two to three med-tech crews available. Those helicopters are capable of landing on a platform or operating a rescue hoist, and we do have the capability to put a med crew into the water to assist anyone in the water, but this is basically a daytime operation. Response would come after call to our command post.

CHIEF RICHARD PETERSON: Santa Barbara oil development is a novel thing for us to be involved with; nevertheless, we have taken an aggressive task, both onshore and offshore, and marine terminals, specifically. Our attempt is to get zero loss through design, process controls, maintenance and prevention programs, detection systems and suppression systems, both activated systems and the more traditional firefighting systems. The standards that we have used are taken from local and national codes by other fire agencies and industry standards. The concerns that we have most strongly are those of low frequency, high magnitude events. So far, we have been successful in creating conditions that require a fully equipped station at Gaviota for oil processing facility protection that will be fully funded by the oil industry. We have fire protection safety plans on the new facilities which require emergency response plans. We have a condition that would call for marine firefighting capabilities, which is a fireboat in this case. Our onshore firefighting system is built-in with state-of-the-art systems employed with research determining what is available.

Our concern with marine firefighting is that the only capability locally is in San Francisco, and Los Angeles, which is not local. We have built-in systems which the vessels are required to have if

they are involved in picking up the product. The San Francisco and Los Angeles systems are included in their port capability. Again, they would not be effective in six-foot seas and would not be responsive to our local concerns. We are concerned about dealing with a marine fire situation and the authority and jurisdiction of conflicts here. In Santa Barbara County, we don't have authority or jurisdiction, nor do we have the capability, to deal with these problems. Within the two years that the terminals will be in place, we hope to be able to deal with these concerns.

CHAIRMAN HART: If a similar situation happened like the Puerto Rican incident, how would we put out that fire?

CHIEF PETERSON: Depending on where it occurred, if on land, or drifting ashore, it would be a local concern, and we would be the lead agency. Again, under the current conditions, we have no capability of dealing with that. At sea, it is the Coast Guard's and industry's concern.

MR. EDWARD SIMONS: I will comment on how the Department of Fish and Game interfaces with oil spills specifically. We have fallen into a role of response since the 1970s, after the 1969 incident in this area. Today, we have more than 300 field officers throughout the State of California. Southern California now has a spill response alternate to my position, Lt. Reed Smith in Ventura. Our responsibility comes from the California Oil Spill Response Plan which gives the Department of the State operating authority role and the State agency, coordinator role. In addition to that, we do enforcement on oil spills, as we have since 1945.

According to Section 5650, it is a criminal misdemeanor. The fine is a very minor thing. But the offense is criminal, and therefore, does attract a lot of attention when it is used. We also have Section 2014 which says for damages to the resources by an oil spill, there will be a civil recovery by the State of California and that is regularly enforced. Under Senate Bill 686, we have been given an order of authority. Our efforts are to prevent and minimize the effects of oil spills. We place containment devices around critical wetlands and places where fish and wildlife habitats can be damaged the most. Our concern has resulted in groups that do planning for areas of critical significance on the maps that they use for cleanup responses; the public and industry have these maps. We get involved in the decision of whether or not to use dispersants to reduce the volume of oil that might reach an area. This has to be weighed biologically and what the effects of dispersants might be because if we disperse the oil into the water column, the oil doesn't disappear. The oil then moves somewhere else and might affect other resources, even though we might not have as much oil moving ashore.

We also get involved in rehabilitation of damaged organisms. Specifically, we have four trailers that the California Coastal Commission (CCC) provided for us through some Federal energy impact funds that have bird cleaning equipment in them. One of those is headquartered in Santa Barbara. We have three others up and down the coast. We are currently involved in negotiations with Vandenberg Air Force Base to utilize their sewage treatement plant as a permanent bird cleaning facility, with some monies we are trying to generate from various sources.

We have also worked recently on sea otter cleaning capability up and down the coast in sea otter range. We have three potential cleaning sites and a laboratory facility to house sea otters at

Diablo Canyon (PG&E), Monterey Bay Aquarium, and at our Department of Fish and Game facility at Granite Bay, south of Monterey. The problem with those is that we have no funds to buy the support equipment for this effort. We have been negotiating with the MMS offshore sitings of the Exploratory I offshore facility and have included that money in there.

The Director of the Department is the official chairman of the Inter-agency Oil Spill Committee. I am his delegate. This Committee of 13 State agencies is primarily advisory, except when a spill occurs, when the State operating team gathers. This Committee has no official capacity to review the State contingency plans.

The passage of Senate Bill 686 (Marks) and the funding mechanism of Senate Bill 959 (Hart) are the upswing of what is happening in State oil and spill response. These give funds to the Department and the Inter-agency Oil Spill Committee. A study of dispersant and oil effects on marine organisms should be made. Our biologists would like to look at a larval form that occurs off our coast, in the upper layers of the ocean waters. We could possibly match funds at this time with NOAA which might eventually provide a full set of maps for the coast of California, and a gas chromatograph fingerprinting lab capability at our water pollution control lab in Rancho Cordova. This program is contingent upon the State receiving Federal funding from the OCS AG monies.

OES contacted us 1,610 times in 1984 from their ocean controller with reports of spills of oil or hazardous waste throughout the State.

CHAIRMAN HART: Could you comment on the Puerto Rican incident? You say that you're advisory until there is a spill. What happened with the Puerto Rican?

MR. SIMONS: Notice of the emergency event went from the Coast Guard to the Office of Emergency Services in very short order. Within 1½ hours, we had half a dozen State agencies notified, which is very good. We had three days of the threatened spill. Initially we geared up the State response team, recognizing that there was no oil spill, but the vessel was burning and being moved out of State waters. The State had a limited jurisdiction. Three days later, the stern sank; we had an oil spill and a request by the on-scene coordinator to use dispersants. At that point, the State has a veto authority. Even though it was not in the territorial waters of California, dispersants can't be used in accordance to the National Contingency Plan. I was not available to determine the use of dispersants to move the oil shoreward into sea otter range.

Upon the determination of combined agencies, Federal and State, at the request of the on-scene coordinator, Captain Bishop of San Francisco Bay, we held meetings on a daily basis and determined on the next day that the oil appeared to be moving offshore rather than towards shore, so there was no request for the use of dispersants. Three days later, we had a phenomenon that is explained as a coastal jet, which moved the oil from its prior position, which was 20 to 24 miles southwest. In less than 18 hours, it moved 20 miles north. The next time the agency saw the oil, it was around the Farallon Islands, which started the real State response with State Parks working with our wardens collecting birds and bringing them into cleanup facilities.

At the same time, we had active involvement of the Water Board and Fish and Game in allowing the forebody of that vessel to be returned to port. We had a two-pronged spill here. In most spills,

the source is abated and everyone can concentrate on the cleanup. This is where we diluted our people because we had people responding to cleanup at the same time we were actively involved in the State oil spill cleanup. We negotiated the conditions to be met for the forward part of that vessel to be brought back into State waters, eventually to San Francisco Bay and to dry dock. That took until November 18. There was not a day during this period that we did not have meetings. At this point, we were not getting new birds in for cleaning (although they were stockpiled). The oil was cleaned up so this was possible, and the forebody was brought to the Bay.

CHAIRMAN HART: Do you feel the jurisdictional roles were well-coordinated?

MR. SIMONS: I have been involved in one major spill (100,000-gallon spill in the Oakland estuary in 1973). In comparison, the coordination was equal or much better among agencies. It is still a situation where there is a limimted number of people who know what to do and they are physically overtaxed at this time. We had Coast Guard people who worked 36 hours straight. This stresses our resources.

Session II, Part B

Hearing Participants:

Captain Vince Agapedo - Santa Barbara County Fire Department
Marie DeSantis - Author and Writer for the National Fisherman
Michael Herz - Tiburon Institute of Environmental Studies
C. W. "Bud" Waage - Clean Seas
Tim Rochte - California Conservation Corps
Archie Snow - Councilman from Redondo Beach, SCAG

CHAIRMAN HART: Although all the questions are open for discussion, we were hoping there would be a greater emphasis on questions such as: What are the technologies for dealing with such accidents? Who has it? How available is it? How are people trained to deal with oil spills and fires?

CAPTAIN VINCE AGAPEDO: Fires may develop that are beyond the capabilities of built-in systems, and beyond the scope of firefighting government agencies. As stated earlier, the capabilities of government agencies in fighting fires is almost nonexistent. The County Fire Department does not have the equipment or the jurisdiction, and the Coast Guard or Office of Emergency Services does not have offshore firefighting capabilities. These services are provided by private enterprises called Hell Fighters (those professionals specializing in eliminating fires from oil and gas well blowouts, well fires, marine tanker fires, platform fires). A few of these companies include Red Adair, Boots and Coots, and Schmidt International. By way of example, I will explain the operations of Boots and Coots, Inc., based in Houston, Texas.

If there were an offshore incident within Santa Barbara County, a jurisdictional agency would be responsible for setting up and maintaining a command system, logistical support, communications and public information. Boots and Coots provides specialized equipment and expertise in working in

support of command already established. They have worked 22 incidents involving offshore fire. Their special resources include: one equipment cache in Los Angeles comprised of a 2,000-gallons-per-minute pump; 8,000 gallons of foam concentrate; associated application nozzles and handles. Additonal equipment and caches are in San Francisco and Texas. Upon request, men from Los Angeles and San Francisco would respond with equipment and provide a barge or loading ship on which foam, pumps, and equipment can be loaded and secured. For an incident in the Channel, Pt. Hueneme would be the closest port to store an equipment ship. At the same time, firefighters from Houston and a ship architect from Virginia would be flown in. Once everyone is flown in and equipment collected, an attack would be made on the fire. The total response time is 16 to 24 hours. A severe incident offshore would require additional pumps from Texas. This would delay action an additional 4 to 12 hours. These are minimum estimates.

Private industry Hell Fighters can be judged as some of the best firefighters in the world. I am comfortable with their expertise, ability to work within a strict command organization, and their ability to handle any incident. However, I am uncomfortable about relying on this system as it stands today. I am leary about the limitations which are a result of the dependency upon the availability of Hell Fighters and the delay involved with equipment caches.

In my opinion, the local public decision makers must make some hard decisions upon what limitations are involved and whether they are acceptable. Santa Barbara County Fire Department will continue to address these questions and provide some of the solutions through proper mitigation during the permit review process.

MS. MARIE DeSANTIS: The technology capable to clean up an offshore oil spill does not exist, and it is unlikely that it will be developed in the near future. Before documenting this statement, I would like to appeal to your common sense. A calm ocean is as smooth and workable as a calm bay. If the currents are also calm, you can skim oil from a calm ocean. The difference between a calm ocean and a calm bay is that it never stays that way for very long, particularly on the waters above Pt. Conception. When the ocean is experiencing even moderate winds and seas, it is impossible to skim the oil. First, the oil is churned up into the water. It should be obvious to everyone that you cannot separate the oil from the salad dressing until someone stops shaking the bottle. So far, not even the oil companies have control over the one who shakes the seas.

Second, and this is a bit more difficult to visualize, even in the most ordered seas, the waves do not stretch in long lines across the sea; rather, the waves exist in herringbone patterns so that even if the mid-ship of a boat is sitting on the crest of a wave, a long outrigger such as used on the long booms of the oil cleanup ships, is likely to sit on the trough or another part of the wave, and all this gives rise to twisting, diving, thrashing, and splashing of the boom through the water which is conducive to anything but skimming. This, remember, is an ordered sea. A sea condition is rarely ordered. Waves superimpose on waves, which superimpose on swells. So far no one has thought of a way to skim oil from such a surface.

The documentation: The vessel, Mr. Clean, built in 1978, 130 feet in length, is the oil companies' star cleanup vessel. According to both the Coast Guard and the oil companies, Mr. Clean

is the state-of-the-art vessel for handling offshore spills.

Last November, when the Puerto Rican broke in two southeast of the Farallon Islands, 35,000 barrels of oil were spilled. For the next eight days, this spill provided a boots-on test for this state-of-the-art vessel in a full range of ocean conditions. Let me give you just two results of that test: On November 6 and 7, the wind and seas were calm. During that 24-hour period of ideal conditions, Mr. Clean recovered a total of 400 barrels of oil, or one percent of the spill. At this rate, it would take Mr. State-of-the-Art 100 flat calm, ideal days to clean up this moderate-sized spill. Second, the next day, November 8, Mr. Clean reported he was unable to recover oil due to weather conditions. These weather conditions were 15- to 20-knot winds and seas that were 5 to 7 feet. These sea conditions are medium to low-medium for Northern California waters. Mr. Clean was not even able to deploy the boom. From that day on, Mr. Clean was only able to work in protected areas, such as anchorages. In other words, throughout the entire incident, Mr. Clean was never able to recover oil on the open sea conditions that were greater than 2 to 3 feet. This is worth repeating again; it is the state-of-the-art vessel. This information I have given comes from on-scene report made by the Coast Guard on the Puerto Rican spill.

I think everyone in this country is rightfully proud of the originality and inventiveness of our technology. However, if a great American industry spends million of dollars to build equipment to walk on water, and millions more on propaganda persuading us that they can walk on water, and if we can then believe that they can walk on water, we betray the very rationality that is the source of our inventiveness. Thank you. (See Exhibit "D" for an article by Ms. DeSantis on the Puerto Rican.)

DR. MICHAEL J. HERZ: I have spent the last year at the TIES looking at the Puerto Rican incident as a learning experience. I expected to be able to come down here to talk about the recommendations and conclusions that came out of our study, and say, "Well, Southern California, because there is production going on here which has already taken care of 'this' and 'this,' etc.," but the more that I have heard, the more disturbed I become because it seems that many of the recommendations that we have made for Northern California are just as relevant to Southern California and that should not be the case. We are a frontier area that hasn't even begun development yet, and as the planning office representative said, you have been looking at offshore oil production here since before the turn of the century.

Let me go through the events of the Puerto Rican because they are illustrative of a number of things that happened. You will see how this event, relative to what the representative from Exxon said about probabilities of occurrence of events, the Puerto Rican even is one that would have fallen into his "unlikely" or "rare" column.

A year ago Halloween, the Puerto Rican, which was an American Flag vessel, 620 feet long and carrying approximately 100,000 barrels of mostly highly refined oil products, lubricating oils, and the like, left leaving San Francisco Bay, outward bound. Eighty-nine miles beyond the Golden Gate, she suffered a large, massive explosion and began to burn. During the first few hours following the explosion, the focus of the Coast Guard and other vessels on the scene was to protect human lives. A deck hand on the Puerto Rican was lost. A pilot, who was getting ready to get off the ship when the

explosion hit, and another person from the Puerto Rican were blown into the water and badly injured. The big problem was getting search and rescue underway and lives saved. Then the attention turned to the fire.

At the time of the explosion and fire, the sea conditions were quite moderate, which made it possible for the City of San Francisco, which was a pre-World War II tugboat converted to a fireboat, to go outside the Golden Gate for the first time in its history to fight the fire. It got there for two hours, suffered an electrical failure and had to retire. The Navy sent two 108-foot tugboats that are firefighting boats. One of them had a failure of its mast that raises nozzles up into the air to drop water down onto the Puerto Rican, so they were out of commission. During this time, the vessel drifted to within three miles of the Marin Headlands; and fortunately, a vessel of opportunity that happened to be in the area was able to get a towline on the stern and tow it offshore.

During the next three days while the vessel was under tow, it was leaking oil, but not a huge quantity of oil. The Coast Guard set up a prohibited area within which they did not want the vessel towed to keep it south of the Farallon Islands and Pt. Reyes Marine Sanctuary, and west of the coast. For some reason that is still unclear, these towing boundaries were violated for 12 hours during the day that the vessel subsequently broke in two, and the stern sank within the sanctuary. In any case, the spill occurred, spillling up to 35,000 barrels of oil. The oil, during the first three days, did as the NOAA spill projectory predicted and moved south, but then there was this mysterious event overnight. Within 12 hours, the oil reversed direction and moved 24 miles north, wrapped around the southeast Farallon Islands, which is the centerpiece of the Marine Sanctuary, set aside because of its high sensitivity and vulnerability.

Mr. Clean, the vessel that Marie just referred to, was, first of all, a Southern California vessel that was called right after the explosion and took 24 hours to get to San Francisco. Within a few hours, it was disabled by what was described as a freak wave. The harbor master says it was out of the channel, possibly because the operators were unfamiliar with the area. She was out of commission for the next three or four days and not available to do skimming.

During the following days after the oil turned north, there was some cleanup attempted; but as Marie pointed out, a very small percentage of the oil spill was cleaned up. Some of that oil did eventually get ashore in Bodega Bay and Bodega Harbor. Five thousand birds were oiled and killed.

This was a major incident. But in terms of a worst case scenario, it does not approach the size of what could be considered a worst case, and yet we had a lot of problems.

The cause of the explosion is believed to be that surface plating over a tank was scratched, and a previous cargo of caustic soda leaked around the tank. Static electricity sparked the explosion and blew open the top as if it were a hinged trapdoor. Recommendations for the future are:

There is a need for increased firefighting capabilities. Multipurpose vessels such as developed for the North Sea and Middle Eastern oil fields, a vessel that is 150 to 200 feet long which is capable of towing, firefighting, oil spill cleanup capability, and tankage capacity, must be quickly on the scene.

One problem that we had up north was that the barges we used for holding the skimmed-up oil

are not preferred offshore. When Mr. Clean filled up, it did not have any place to pump its oil and had to go all the way back to San Francisco to discharge the 800 barrels it had picked up. There was also difficulty in lack of compatibility of hoses between vessels that were cleaning up the oil and the barges holding the oil. The equipment must be on the scene and it must be compatible.

We found, as the Puerto Rican was towed around, the days after the fire, there existed no plan designating areas in which you might tow a disabled vessel if it lost power or is on fire. These must be less sensitive areas.

There is not a good understanding of the current regimes that move oil up and down this coast. What carried the oil 24 miles north in the Puerto Rican incident was a phenomenon that happens annually. We have two coastal current regimes; a California current that moves south during the spring and summer, and the Davidson current that moves north during the fall and winter. This changeover phenomenon was in the process of occurring, and it should have been possible to predict because of the wind shift 12 hours before the current shift. It could have been possible to put some booms out at the Farallons to prevent damage to that sensitive habitat.

Our recommendation for the oceanographic community is that we need to have research programs to better understand these offshore currents that move the oil in and out and up and down our coast so that we can make accurate predictions. Ideally, we should have some data buoys that record wind and barometric pressure and current directions so we know what is going on.

We feel that it is the responsibility of the industry to pay for the research and equipment because the industry is making money moving the oil back and forth. Ultimately, the consumers will have to pay part of that cost, but it seems that the ability to protect these resources and the coastline is a cost of doing business.

Cataloging of resources has been done here to a better extent than in Northern California. However, it is one thing just to map the resources, but the second step is to set up a mitigation response program. If you have identified a delicate habitat or area of biological significance, or area that is vulnerable, you want to note that it is vulnerable and have the equipment and people trained to mitigate oil coming ashore in that area.

In response to coordination and communication, we are concerned about the situation when the Coast Guard set boundaries to not have the vessel towed in, but they were violated. There is a problem with having an unseen coordinator, and explicit orders should be written down, and a designated backup person needs to be present to enforce these plans.

Again, I was surprised to see how vulnerable you are with extensive production already going on. (For a more complete discussion of the Puerto Rican episode, see Exhibit "E".)

COUNCILMAN ARCHIE SNOW: I am also a member of the Emergency Planning Committee for Los Angeles County, and we feel that this oil production problem will be a major problem for us. Every community in California is supposed to have an emergency plan in place. I don't know how many coastal commmunities have a plan, but perhaps the Office of Emergency Services should mandate that all communities, whether on the ocean or waterways, have some sort of plan in the event that there is a spill of oil or toxic substances in their waters.

SCAG (Southern California Association of Governments) is responsible for the development of air quality management, regional transportation plan, and acts as a clearinghouse for the region. With this type of environmental and transportation background, SCAG is vitally concerned with the OCS oil development. This aspect includes risk management as being discussed at this hearing today. I would like to focus on the transporting of the crude by pipeline from Santa Barbara to the Los Angeles Metropolitan region. SCAG believes there are significant factors involved with transporting oil by pipeline and they should not be ignored.

Transportation through pipeline requires blending the oil with natural gas liquid or heating the oil so it will flow easier through the pipeline. This pipeline is going through the permitting process at this particular time. We believe this process presents a potentially serious public hazard.

The potential of fires or explosions should be planned for early in the design process. For example, the Los Angeles pipeline will be 130 miles long, pass through 12 cities and 18 miles of unincorporated county areas. This pipeline must be structurally sound and consideration must be given to densely populated areas.

Earthquakes present risks. The best way to deal with this is a thoroughly tough environmental review process. Only in this way will the possible risks associated with a ruptured pipeline be kept to a minimal level. We need an adequate study of define all the risks associated with pipeline development. Our experience with OCS and EIS/EIRs have not been good. SCAG does not believe that EIRs to date accurately provide the full information and effects. A big problem is the ambiguous language used in these documents, such as "best available technology". Who defines what is best technology? We believe the State should be the lead agency in regards to worldwide research in terms of seismic activity and pipelines.

Our community review committees also need more time to prepare for this development which is being thrust upon us, whether we want it or not. (For complete test, see Exhibit "L".)

CHAIRMAN HART: Are the EIRs too technical?

COUNCILMAN SNOW: Yes, we cannot understand their technical jargon. We do not have the time or money to decipher these reports.

MR. C.W. "BUD" WAAGE: (Please see Exhibit "F" for the statement from Clean Seas.)

MR. TIM ROCHTE: I am the area manager of the California Conservation Corps for the San Luis Obispo area, from Big Sur to Pt. Conception.

The California State Resources Code enforces the CCC and employs 2,200 young adults statewide to undertake public conservation works. We also assist public agencies in emergency operations. The CCC supplies a disciplined and energetic source of workers to the benefit of the State's economy and environment. As such, we are a support rather than a lead agency.

Regarding emergency response capability, we have usually been involved with fires, floods and flies (Medfly). We have also had direct experience with oil spills, and I have led two cleanup operations over the last four years.

When an incident occurs, the CCC is dispatched through the local county emergency services director. We work under the sponsorship of a public agency. The CCC can immediately respond to

most coastal areas of California within one to four hours of the dispatch call. Camarillo is closest to this area (Santa Barbara) and would be the first to respond. The number of personnel we can mobilize depends on the size of the incident. CCC provides its own transportation, uniforms and basic hand tools.

In the past five years, the CCC has responded to three major oil cleanup operations; two in San Luis Obispo Creek in San Luis Obispo County involving pipeline ruptures. We were involved with the cleanup of water from the Puerto Rican incident. In the creek cleanup operations, our crew was responsible for removing oil from the creek bed and shore. The 1980 effort required 40 CCC workers six weeks to clean it up. The August, 1985 oil spill involved 30 staff workers in a three-week effort. In the Puerto Rican incident, the CCC was responsible for collecting, transporting, and cleaning water fowl. One 15-person crew worked for two weeks on that operation.

Our goal is to respond to emergencies quickly and deal with bureaucratic matters later (i.e., billing sources after commencement). As far as training goes, it has been provided by Union Oil in San Pedro, a few years ago. We also receive specialized training by onsite experts. Our Corps members and staff are well-trained in disaster relief of all sorts, and they are capable of any clean-up operation.

Session III

What are the best measures to prevent such accidents? What technology should be employed? What training is needed and what inspection procedures should be followed? In light of the preceding discussion, what legislative actions should be taken to reduce and to mitigate the risks of oil- and gas-related accidents?

Hearing Participants:

Susan Hansch - California Coastal Commission
Suzanne Rogolin - California Coastal Commission
Maurice Scherb - Consultant on Marine Safety
Carmen Pizzariello - U.S. Merchant Marine Academy, Computer Aided Operations Research
Gordon Cota - Santa Barbara Fishermen's Association
Jerry Asplund - President, ARCO Marine
Dr. Floyd Tuler - Worcester Polytechnic Institute, Mechanical Engineering
Dr. Jean-Louis Armand - UCSB Marine Science Institute
Clair Ghylin - Chevron
Robert Sollen - Sierra Club
Martha Blum - Santa Barbara League of Women Voters

MS. SUSAN HANSCH: The California Coastal Commission is involved in dealing with the major risks in offshore gas and oil operations. CCC has jurisdiction over the exploration and production of

oil and gas in State and Federal waters. Before any exploratory or developmental operations can occur, the CCC must find that the project is consistent with the resource protection policy of the Coastal Act. The Act does define the offshore energy development as coastal dependent and establishes many energy operations as priority uses. The Act does require the Commission to find that the offshore energy facilities are mitigated to the maximum extent feasible and that there is no environmentally preferrable location. The Commission has vigorously addressed the issue of prevention of oil spills and accidents by requiring specific mitigation measures for projects and funding for cleanup equipment, training facilities for the California Maritime Academy and the State Lands Commission.

There has been much done by all State, local and Federal agencies, but there is still much to do. Use of the best available equipment is critical. This equipment must be continuously serviced and upgraded. The staff that uses this equipment must be fully trained and tested for competence. Inspection of tanker and offshore facilities must be regular to correct equipment problems before accidents occur. The CCC calls unannounced oil spill drills. These are a critical hands-on test of the equipment and personnel. All existing techniques is not enough -- oil spill equipment is only effective in fairly calm seas. When resources are especially valuable, it is sometimes better for the public welfare to deny a project. One of the biggest challenges facing Federal, State and local governments with offshore oil and gas production and transportation is cumulative impact; that is, the accumulated risks of offshore drilling and tankering. There is a strong need for overall planning to address these cumulative impacts and establish acceptable thresholds and risks.

Although the focus of today's hearing is offshore risks, I think it is important to stress the need to assess land-based facilities as well. Any legislation or overall planning for offshore facilities should also take into account the associated onshore facilities.

MS. SUZANNE ROGALIN: In reference to earlier testimony about the dangers or lack of dangers in the transport of molten sulfur, I would like to mention the incident in the San Francisco area. There was an accident with a truck carrying molten sulfur from a refinery in Benicia, and there were fatalities involved.

According to the National Academy of Sciences in the period of 1969 to 1979, there were, in the OCS, 38 collisions with platforms; 11 of these produced structural damage, 3 were total losses.

How statistics are used in risk management depends on where you stand. In a recent EIR, the chances of the explosion of a vessel in port were given at the highest as once in 80 years. Any nonexpert who reads a newspaper could list three explosions in U.S. ports within a few years.

The best measures to prevent such accidents involve good training, inspection and proper equipment. Local fire departments must board tankers and check inert gas systems. Inert gas systems must work properly and that requires specialized training, which is not expensive or long to learn. We should provide for inspections by local fire departments before unloading begins. Unannounced inspections and emergency evacuations should be practiced on offshore facilities. Everyday types of accidents should also be analyzed. This equipment is needed:

Fireboats with a minimum of 6,000 to 12,000 gallons per minute systems to deliver water to the

deck of burning platforms or tankers. They should be under jurisdiction of the Santa Barbara County Fire Department.

There should be fireproof booms and tugs capable of holding disabled tankers from grounding. There must be adequate facilities for handling ballast discharge. Pollution from dirty ballast discharge contributes 90 percent of the oil pollution from ships; accidents, only 10 percent.

Necessary legislative action should include 200-mile pollution control jurisdiction, strengthening ports and waterways standards, and providing the Coast Guard with increased staff enforcements. The State should require fireboats and rescue tugs at all ports.

Comprehensive disaster plans should be mandated for all organizations involved in OCS operations.

CHAIRMAN HART: Have these recommendations been advocated in the past?

MS. ROGALIN: Many of the equipment recommendations have been proposed.

MR. MAURICE SCHERB: I have been a consultant on marine safety for many years, and I wish to make these points. Management must be responsible for safety. Reliable data banks can provide early warning systems which allow you to catch a problem before it develops into a disaster. Black box recorders help trace down complications. They should be onshore as well as on ships. We should imnprove initial designs, rather than adjust completed projects.

MR. CARMEN PIZZARIELLO: CAORF (Computer Aided Operations Research Facility) at the United States Merchant Marine Academy has been in operation since 1976. We have hi-fidelity ship handling simulation that can simulate any vessel in any geographical area. By modeling problems, such as the movement of ships, and simulating the perspective of a captain on a bridge, we can record and analyze data with the most sophisticated simulation to reduce risks involved in tanker manipulation. This can develop more reliable and predictable vessels which contributes to safety. By using simulation, levels of risk can be quantified. (See Exhibit "C" for a statement on the work of CAORF.)

MR. GORDON COTA: My fishing involves transit near the shipping lanes, and I would like to say that American Flag vessels that we deal with have professional, sophisticated, and well-trained mariners. But unfortunately, ships come through with no English-speaking crew members and that is our biggest problem. I would like to recommend that in transit through the Channel, someone on the bridge speaks English.

In the past, I did not encroach on other people's expertise. Concerning the best technology, it does not do any good if human mistakes are made.

Where are the standards? What is the minimum level we will accept?

MR. JERRY ASPLUND: The best measure for preventing such accidents is to have a strong organization comprised of terminal operators, steamship operators, local regulatory authorities, and others within the area that require some input to rulemaking and operations. This group of people can work together to develop operating guidelines, terminal operations, and a general source of caring for the environment. The Port of Valdez is a good example of such an organization.

We have the technology to meet the needs of safe and effective marine transportation.

However, as many have said today, one part of any system is the human element. The best we can do is to continually train people and hope that they can react wisely in time of emergency or normal operations. We need up-to-date, competent workers.

Safety cannot be compromised. Officers and terminal operators must be trained to know what is safe and what is not. We should have firefighting schools and in-house firefighting training. Navigation capabilities must be maintained and improvements made. Oil spill training must be continuous.

Existing legislative regulations are sufficient. Terminal regulations and oil spill contingency plans are all sufficient. The key to successful operation is solid cooperation.

DR. JEAN-LOUIS ARMAND: Thank you, Senator Hart. If the mike works, I will attempt to speak English.

I would like to address very briefly the subject of research in the area of safety and reliability of offshore oil and gas operations.

The offshore oil industry began off the coast of California nearly one hundred years ago (the first hole over water was drilled from a wharf in Summerland in 1887) before going through the expansion we are witnessing today. California has watched all this activity, but with a few exceptions has failed to take a very active part in the associated technology, which is for the most part still developed in Texas. The engineering challenges to be met in order to insure safety and reliability of operations as oil and gas exploration and exploitation lie at the frontiers of technology, and to open new and fascinating fields of investigation.

This state of affiars is to be compared with the situation of Norway. Ever since the start of offshore oil and gas operations in the North Sea, Norway has made it mandatory for the oil companies drilling off its coast to substantially contribute to a research fund for improving safety and reliability of offshore operations. This level is used for research which is, for the most part, conducted in Norway. As a result, Norway, a county with less than 5 million inhabitants, has during the past decade become the undisputed world leader in the advanced aspects of offshore technology. The rules of the Norwegian Classification Society, Det Norske Veritas, for the design, construction, operation, and inspection of offshore structures, originally developed for the harsh North Sea environment, are now enforced worldwide. Norway is also consulted whenever a disaster takes place anywhere in the world and asked to draw the lessons which would, hopefully, prevent the reoccurrence of such mishaps. All this started only 15 years ago.

Still, the nature of offshore operations varies greatly from one geographical area to another, and each region should be the subject of specific studies. The University of California with the combined facilities of its campuses at Berkeley, San Diego (Scripps), and Santa Barbara, possesses an expertise in Ocean Engineering, which in the nation today, only MIT and Woods Hole can possibly compare with. It is to be hoped that research in the area of safety and reliability of offshore oil and gas operations, now only timidly supported, will be strongly encouraged in the near future by Federal and State agencies, as well as by oil companies. It is after all in the best interest of this country to maintain and develop an appropriate technological know-how. Thank you, Mr. Chairman.

CHAIRMAN HART: Thank you, Professor. Can you tell me a little more about the taxing mechanism in Norway and how that works? Testimony was that Norway has a system that when there is development that takes place, the oil companies are basically taxed in some fashion and that money goes for research ...

DR. ARMAND: ... That is just some of the tax. They are heavily taxed in order to have the right to drill and to operate in the Norwegian waters. But the point is that some of this tax is directed to extensive research, which has put Norway in the forefront of research and know-how in offshore engineering.

CHAIRMAN HART: And we have no such requirement or taxing authority here in this country?

DR. ARMAND: Well, right now research is being supported by, but I would say, very timidly, NOAH, USCG, and oil companies, which all do their own research. There is no combined effort to make all of these results available. Oil companies know their stuff very well, but they do their own research, and they usually do not make the results available to the public nor to other research agencies.

CHAIRMAN HART: What area of research do you feel is most promising or most in need of attention as it relates to our own oil development procedure here in Southern California? Is there anything that stands out that you think is particularly pressing in terms of research that you think needs to be done at this point in time?

DR. ARMAND: Well, the point I am trying to make is that technology has tremendously evolved in the past few years, and we now have no solutions, but we have ways of approaching problems which are new. Some of them came from the nuclear industry, and a lot of them from aeronautics (it was mentioned a few minutes ago that a tremendous effort for safety and reliability is taking place in aeronautical engineering, which is correct).

SENATOR MARKS: How big is the tax? What percent is it and is it high?

DR. ARMAND: I do not have the exact figures, but I can assure you that the research conducted by Det Norske Veritas and by the University of Torendine in the area of safety and reliability alone is in the area of $50 million a year.

SENATOR MARKS: I would think, and nobody likes to pay taxes, but I would think that if the oil companies were assured that this would be helpful to them, as well as helpful to their competitors, that they might not object to some form of tax, if it were not too high. Now, maybe somebody could sometime talk about it. It would seem to me that if the oil companies are paying right now for their own research, it might be an advantage to them to join together and try to conduct research. I would really appreciate it if somebody would comment on that.

MR. DUNAWAY: Independent research going on at the same time by many different companies produce a large amount of difference in approaches and ideas to problems that would be lost under one research organization. Many inputs means more ideas. Whenever an agency develops a new technology it can be opened up to other companies to make sure all have this new technology.

SENATOR MARKS: I would seem to me that if companies were to support in some way (I am not suggesting a heavy tax), organizations such as the Coast Guard that are helpful to them, that it

would be to their advantage.

MR. BARRY SCHUYLER: Professor Marshall Tulin had hoped to give this presentation himself, but he asked that it be put into the record, and I am happy to read it for him. He is a professor of Ocean Engineering at UCSB. (See Exhibit "H" for Professor Tulin's letter.)

CHAIRMAN HART: I want to thank again all our panelists for being with us today, and I hope you will be able to stay around if there are some additional questions that are forthcoming. I would like our final group of panelists now to come forward. They are: Dr. Floyd Tuler of Worcester Polytechnic Institute; Mr. Robert Sollen of the Los Padres Chapter of the Sierra Club; and Mrs. Martha Blum of the Santa Barbara League of Women Voters.

DR. FLOYD TULER: Thank you, Senator Hart and members of the Subcommittee. My name is Floyd Tuler, and I am currently a professor in the Mechanical Engineering Department at Worcester Polytechnical Institute in Worcester, Massachusetts. I am pleased this day to get the opportunity to get the chance to appear before you, and in passing, I would like to mention that I am also pleased to get the chance to come back to this area where I used to live for a number of years.

Today I would like to make some comments concerning the use of risk analysis in offshore safety and environmental management, both in the United States and abroad. These comments come from a research project conducted at MIT about four years ago, and supported by the MMS through a contract from Sanndia National Laboratories. The findings and opinions are solely mine and those of my co-workers. My activities in this area have continued, and I am currently conducting a risk analysis of oil spills in the Gulf of Mexico. Our studies of the potential and the limitations of using risk analysis in offshore safety and environmental management suggests certain policy actions for consideration by governmental agencies, private operators, and other parties interested in offshore activities.

Risk analysis can be used by regulatory agencies to help set priorities for enforcement of existing safety and environmental requirements, and for establishing new regulations to address newly discovered or potential problems. For example, as discussed earlier, the overall plans for development off the California coast might be improved by studies of the potential conflicts between offshore activities in shipping lanes in the region. These methods can also be used for existing regulations to determine whether they are achieving their goals. There have been instances where risk was lowered by not requiring standby ships for North Sea platforms. Previously, standby ships had been mandated by law.

Private operators, such as oil companies, drilling contractors, equipment designers, and system fabricators, may wish to expand their use of probablistic methods in their studies of new systems they propose to use. This practice could help and make their operations safer and less costly in the long run for themselves, their workers, and the environment. Furthermore, in addition to just publishing the results, publishing the assumptions and methods of such studies would provide for criticism and could help allay public concerns about offshore hazards.

Finally, public interest organizations and local government should also be alert to the opportunities that greater use of these formal methods of analysis may present to them. If properly

used, such methods offer the hope of better control of low probability, high consequence events of the sort that so often motivate opposition to offshore and other major projects. It is important for such groups to learn how risk analysis works and how it is used so they may become informed participants and critics of its use.

We should realize that risk analysis is not a panacea for the management of any aspect of offshore oil development or safety control, and it should be considered for use with full awareness of its strengths and its limimtations.

There appears to be little basis for imposing on and requiring operators and other parties that they carry out formal risk analysis of all projects on a routine basis. Instead, at the current state-of-the-art technique, and of its practice in the United States, risk analysis is a tool that should be reserved for use in exceptional circumstances. For most applications, the use of risk analysis has tended to focus the attention of analysts and decision makers on low probability, high consequence events. Because risk analysis is oriented towards catastrophic events, it is unreasonable to expect that it can substitute for the more traditional types of safety and environmental studies that tend to focus on more likely events that could happen everyday. But these traditional methods are inadequate for addressing these most catastrophic losses, thus the two approaches can best be viewed as being complimentary.

It should be noted that risk analysis is not just another technique of analysis like others used by good engineers. Because it is based on analysis of probabilities, it involves an entirely different mind-set from the deterministic methods that are traditionally used. Prerequisites to making effective use of risk analysis is the willingness to accept the fact that nearly anything can happen at some level of probability, but that not all such events are equally probable or equally damaging.

Finally, you may wish to consider more far-reaching changes in the regulatory system that would take advantage of the power of formal risk analysis. Used properly, risk analysis can allow for more effective regulation of safety and environmental risks, while allowing industry greater flexibility in the selection of available technology and operation methods, and while assigning more of the responsibility for the effective control of hazards to the operating company.

This might be done for example by adapting the self-regulation approach known in Norway as internal control, or by requiring that operators adopt a formal program of quality assurance. Under the system of internal control, operators must fulfill a set of overall procedural requirements for safety management that substitute for the estimate and oversight of detailed design and operating rules by regulatory authorities. As compared with more traditional approaches towards regulation, this system involves substantially less day-to-day oversight of company operations by regulator authorities, while it strengthens the accountability of operators for the consequences of their activities through full public disclosure.

Clearly, as we have heard today, the rapid increase in offshore activity in Santa Barbara will overtax the regulatory and emergency response agencies. Fewer regulations require fewer regulatory staff that are needed if every installation is supervised by government representatives. Nevertheless, all offshore designs and operations should be made subject to random spot checks by authorities.

Formal analysis of risks plays a key role in determining whether a proposed design is in compliance with the overall levels of acceptable risk set forth by the regulating agency. Effective use of the methods of internal control requires that a level of acceptable risk be specified so that the operators can show that they have taken the steps necessary to design an acceptable system and an operating plan. However, establishing a level of acceptable risk has proven to be quite controversial in Norway for offshore regulation, and in the United States for regulating nuclear power. Whether an acceptable level of risk can be estimated for offshore activities in the California coastal regions remains to be determined.

In summary, the use of risk analysis as a tool for identifying and mitigating hazards from offshore operations provides both opportunities and potential problems for all the parties concerned with these activities. However, increased use of these techniques can, I believe, help to make offshore operations safer. Thank you.

MR. CLAIR GHYLIN: Thank you, Senator Hart and members of the Committee, for giving me an opportunity to be here today. With your permission, I would like to submit a 20-page formal statement for the record and just briefly make a couple of comments.

My name is Clair Ghylin. I am the General Manager of Land for Chevron in the San Francisco area, and I have lived in California and have participated in offshore matters for more than the last twenty years. I think the general tone of the hearing of the conciliatory and cooperative attitude is encouraging and an indication that we will continue to try to resolve the problems of offshore oil development through mutual meetings such as this, and I commend the Committee for this.

Mr. Asplund spoke about marine terminal laws and regulations, and I would like to just limit myself to exploration and production of platforms and things related to that, although I think I will reach the same conclusion that he reached: that we have enough laws and regulations, and we would encourage you to look toward further cooperation between the governmental agencies, the industry, and the different levels of government to voluntarily, and through cooperative programs, install the necessary requirements as far as safety or pollution control.

I say this because I believe many of our difficulties have occurred because of the number of unrelated laws and jurisdiction problems that have been created by overlapping Federal, State, and local laws. In the statement that will be filed with you, for instance, I list the 34 Federal laws that primarily regulate our operations in the Federal waters. Many of these were addressing individual problems; many of them created individual Federal agencies; and many of them were passed without consideration of their impact or effect on other Federal laws, or State or local laws. We would encourage you to use the existing process, and the existing regulatory agencies, if possible, to add or detract or change from any of the risk analysis of safety programs you are considering.

One of the issues that was raised by an earlier speaker was the flexibility of existing regulations and requirements when you have changing environments and changing technology. For example, the County of Santa Barbara, in its regulatory regime, has imposed on my company at the Pt. Arguello project a condition that says "if at any time the County determines that these permit conditions are inadequate to mitigate effectively, significant, environmental impacts caused by the project, or that

recent proven technological advances could provide substantial additional mitigation, then additional reasonable conditions shall be imposed to further mitigate these impacts." I mention that because it is an example of the kinds of permits, 160 from the County of Santa Barbara on our project, and I do have the number, but many from the California Coastal Commission and the D.O.I. on our project, the kinds of advance flexibility that the regulatory agencies have attempted to build into their permitting conditions.

This is understandable when you realize that the risk analysis process for our Pt. Arguello project, which was really done from environmental studies, is now in its tenth year and certainly environmental, technological, and project changes have occurred since we have started. But the last exhibit that is attached to the formal papers which I will present to your Committee shows the OCS timetable for our Pt. Arguello project, and it starts in 1976 when the D.O.I. initiated its environmental studies prior to the holdings of the lease sale. Those studies went through 1977 and the first half of 1978, at which time a series of public hearings were held and a final EIS was adopted, and conditions were imposed on the leases to be sold designed to protect against many of the risks that were talked about here today.

Following the sale in 1979, environmental studies were immediately commenced for the purpose of immediately obtaining from the California Coastal Commission and to D.O.I. permission to drill exploratory wells. Those environmental studies began in the middle of 1979 and were completed in the middle of 1980, at which time the State held public hearings and adopted approval of those environmental studies. It was 18 months of studies for 90 days of drilling. That initial drilling resulted in the discovery of the Pt. Arguello field, and we then started our own environmental studies as part of our plan of development under the Federal regulations. That was in the middle of 1981. Those studies were finally completed in October of 1985, when they were certified by the County of Santa Barbara as being complete environmental studies under NEPA and CEQA.

I mention that only to show that it is an ongoing, volatile sort of a situation, and that we do have plenty of opportunities for analysis and resolution during the existing process if the problems are raised at any of the times that they can be raised. I think the example that Ms. Guzman used/mentioned this morning on the joint review panel, which was a cooperative effort between the Federal, State, and local agencies in completing the requirements of NEPA and CEQA, is an example of how the existing process can be used in a voluntary cooperative manner. We should probably look at that before we look at or consider new legislation. Thank you.

CHAIRMAN HART: Could I just ask one question? I carried some legislation some time ago that was opposed by the oil companies, and I have never fully understood why, but I would be interested in your comments. This legislation required that there be State certification of people who worked on oil platforms, and part of our presentation was that we license almost everyting else in California -- we license beautificians, barbers -- here are people that are involved in things that are of great danger to their own health and safety, to say nothing of the surrounding environment. Should there not be some mechanism by which we insure in a governmental way that people are properly trained who are working on these facilities? I guess I direct that question to you, and I

would also be interested in MMS' response.

MR. GHYLIN: Yes, I would defer to Mr. Dunaway, but let me say that I think there is no question as to the objective of the legislation that we are all equally concerned primarily about --the safety and training of the employees. I think the problem we see is another jurisdictional overlap problem.

MR. DUNAWAY: The MMS has training programs for all personnel. There are also yearly refresher courses. Graduates carry a certification card.

MR. TROUT: The State also has training programs, more stringent than those of the MMS. There are yearly brush-ups, and a daily drill is required.

MR. SCHERB: What about the use of drugs on platforms? Are inspectors looking for such use?

MR. DUNAWAY: Yes, but the MMS feels that oil companies are primarily responsible for that.

CHAIRMAN HART: Are there Federal regulations about whether drugs or alcohol are prohibited -- I guess drugs, if they are illegal, obviously -- but about whether alcohol is prohibited on platforms?

MR. DUNAWAY: We do not have a specific requirement, ...

MR. GHYLIN: Our company does, and I believe all the other companies operating in the Pacific region have absolute prohibitions against drugs and alcohol while on the platforms. The only exceptions are some prescription drugs, and those are very limited and monitored. Usually the person is taken back to shore.

MR. ROBERT SOLLEN: Thank you, Senator Hart. Let me say, first of all, that I am oil coordinator for the Las Padres Chapter of the Sierra Club, which is the local chapter, and that this statement has been approved in principle by the local chapter, but there was not time to run it through the regional and national bureaucracy of the Club, so this does not necessarily represent National Sierra Club policy. (See Exhibit "K" for the Sierra Club statement.)

CHAIRMAN HART: Thank you, Mr. Sollen. Let me just ask you one question. Based on the previous speakers' statements that we already have enough regulations, they would have some concerns about some of your proposals. I would like to ask you if you would view these recommendations as ones that would be added to the existing framework or regulations, or do you see this as in any way being able to substitute for some of the existing regulations? That is, do you buy the argument that there is already so much overlap and so many different requirements that we need to do some streamlining, as well as to deal with some of the issues that you have brought to our attention today?

MR. SOLLEN: I am interested in streamlining. I do not know of any additional requirements that should be put in place. The conditions put in place by the County, for instance, are very stringent; there are volumes of conditions numbering into the hundreds. My point is that putting them on paper does not mean they are going to be enforced, and I do not propose new agencies or another layer of bureaucracy. What I propose is a joint powers agreement among existing agencies, and not the creation of any new ones.

CHAIRMAN HART: Let me again try to summarize what you are saying: That the problem is

not so much the existing regulations, the problem is the enforcement of the regulations, and that too often the enforcement of the regulations is left to the oil companies themselves, or to agencies like the SLC that may have an inherent conflict of interest. What we need in terms of enforcement authority is a truly more independent body to enforce the regulations? ...

MR. SOLLEN: That could cross jurisdictional lines. We have heard from the County Fire Department today. It cannot possibly cope with something such as a large industrial fire across the waterline. You leave the beach and enter the water, and you change agencies which have authority. You go three more miles, and you again shift to another whole set of agencies. Perhaps the agency with the most authoriity is the Coast Guard, which does not have to observe this three-mile territorial line, but other agencies ... where the State Lands Commission leaves off, the D.O.I. has to pick it up.

MRS. MARTHA BLUM: I am Marty Blum, president of the League of Women Voters of Santa Barbara. We thank you for this opportunity to be heard today. It is through such open deicision making that makes our government responsive, representative, and accountable.

The League has monitored the situation in the Santa Barbara Channel. In preparation for the vast increase in oil and gas production, we have attended numerous hearings, workshops, read reports, updates, EIRs, and EIS's. We have observed that the planning system itself is often the problem, allowing little time for sound comprehensive planning.

Santa Barbara County planners have taken each project as it comes to them on a case-by-case basis, but in looking at individual cases, the overall picture is often lost. A look at the cumulative effect of oil and gas development is necessary. Only recently has our County put into place some policies having to do with these increases in developments, and the League has observed the County's uncertainty and fear of what State and Federal preemptions might do to the environment here in Santa Barbara.

It is the League's position that we support efficient, effective, and equitable balances of responsibility and authority among the levels of government, with accountability to the public. In light of our position and our observations, the League of Women Voters of Santa Barbara makes these recommendations:

1. Coordination of planning for accidents with respect to local, state, and Coast Guard authorities. Areas of responsibility for each agency should be clearly defined, and funding for implementation should be provided.
2. We support funding for the State Coastal Commission. This was mandated by the voters to protect our precious coast, and such protection can only occur with proper funding of the Commission, which has been so cut back in recent years.
3. We support local air quality plans which have contingency provisions for accidents that impact air quality. Local air quality attainment plans should be amended, providing for the increase in oil and gas production. The League urges the State to take a vigorous role to help this process. The State has provided guidelines for air quality plans, but we believe the State should also provide strong leadership in implementing air quality plans.

Thank you for your consideration.

SENATOR DAN McCORQUODALE: Thank you. Any questions? All right, thank you. This concludes this panel.

We have some people now who we have asked to speak, and we can just have them come up. I believe there are four of them. Our first speaker will be Horace Pennington.

MR. HORACE PENNINGTON: Good afternoon. My name is Horace Pennington of World Oil Products, Inc., out of Ventura. We are a new company in Ventura, and we are here in support of offshore oil development in California. We have developed a new safety product that we would like to introduce. We have pamphlets that we have introduced to this panel, and also to the MMS in Washington. It is for closure of the drill stem during offshore drilling, hydraulically. At the present, the only means to close this is manually, and we are trying to show that we are in support of the latest safetey technology to prevent catastrophic situations. I will have a pamphlet in the back. Thank you for your time.

SENATOR MARKS: I would like to ask just one question. Has this product been adopted by the oil companies?

MR. PENNINGTON: At this time, no, sir, it has not. We are in the process ...

SENATOR MARKS: Has it been presented to them?

MR. PENNINGTON. Yes, sir. It was presented to them originally in 1981 when our original unit came out, we were the only manufacturer in the world that manufactured such an item. It was not mandated at that time. Now there are two competitors who do manufacture this item. We feel that it will be mandated due to the safety features of it ....

SENATOR McCORQUODALE: All right, very good. Thank you. George Silva?

MR. GEORGE SILVA: Members of the Subcommittee, I am George Silva. I have had over ten years' experience in emergency planning at the local government level. I am currently providing consultative services relative to emergency management systems. Because of the lateness of the hour, I will keep my remarks very brief.

First of all, I am not here to sell you anything other than, perhaps, a concept. What I would like to do is very briefly address what I believe to be the fundamental issue of this particular hearing. It is the word "risk". You have heard of all types of risks, mostly engineering risks, some human performance failure risks.

I believe that essentially there are three types of risks that we as human beings recognize: actual risks, whether we recognize them or not, that in fact exist; known risks, those things that have occurred, therefore, we are convinced they are risks; and finally, perceived risks, whether actual or not, we believe them to be risks.

This morning it was disclosed that a great deal of effort, as well as a great deal of money, has been spent to provide answers to many apparent risks posed by oil and gas development and processing, both offshore and onshore. I would like to address my comments in the broader sense, particularly in Santa Barbara County. We are concerned from a risk standpoint of onshore, as well as offshore effects of oil and gas development. As someone put it this morning, we are learning answers

to risk issues, and I believe that to be true, and we will probably learn a lot more answers in the future.

However, even though we are searching for more of these answers relative to risks in this area, I am not convinced that we have yet understood the basic question. We are dealing essentially with answers without fully understanding the questions. Of course, that question is: "What are all of the risks that we deal with in this area? And, what is the importance of each of these risks?" Today, we have heard discussed vessel collision risks; vessel with vessel, vessel with platform, pipeline failure risks, explosion, fire, operator failure, and numerous other risks. These are all valid, I agree. However, are they the total picture of risks presented by the future oil and gas development off the coast and the processing facilities on the coast in the State of California?

Until we have an all encompassing, comprehensive risk analysis performed, relative to this development, we will not be assured that we are addressing all of the risks of concern. I therefore recommend to this Subcommittee that you give consideration to recommending to the Legislature that part of the revenues that will be realized relative to oil and gas development, perhaps some of the Federal impound funds could be permitted to a State-sponsored comprehensive risk analysis of energy development as it relates to the State of California.

What are the benefits that might be derived from such a comprehensive risk analysis? (I am not referring to an engineering study or a psychology study, but rather a comprehensive risk analysis.) I believe the major benefits of such a study would be to provide not only the community, but I think the industry, with a comprehensive understanding of what we will be dealing with in the future, and thereby making it possible for a more effective commitment of all of our resources, public and private, to address those risks that are of greatest concern. Of course, we deal with, and we have used the word today frequently, mitigation. From a commercial standpoint, of course, mitigation generally focuses on preventing risks developing, and to unwanted, undesirable consequences, and that is understandable. Every operator wants to operate the facility at its maximum with minimum amount of liability. From the community standpoint, I think most people would like to see that operation equally conducted safely, but in addition with the possibility that certain occurrences will not occur in the future.

We have identified all of the reasonable possibilities; therefore, I have addressed them in advance. I might call to your attention that I suspect that in most major chemical operation in the world today, that the operators are much better prepared to deal with the accidental release of methylisocyanate as a result of Bhopal. I am not sure that most major chemical operations today throughout the world know and have identified what the next major catastrophe may be. The only route to doing that is to do a comprehensive risk analysis in advance, identify all of the possible undesirable consequences, use an appropriate matrix to determine all of those risks that are of concern, and then prioritize them so that the community, and the industry, can then address those issues appropriately. To not only mitigate the possibility of their occurrence, but should a catastrophe occur, that both industry and the community is better prepared to deal with that.

Therefore, I recommend that some of the energy-generated revenues be committed by the State

to conduct such a comprehensive risk analysis which would then be of use to all coastal communities, to the State in general, and certainly to the industry. Thank you.

CHAIRMAN HART: Thank you very much. Michael McDermott.

MR. MICHAEL McDERMOTT: Good afternoon, Senator Hart and members of the panel. I am Michael McDermott of Santa Barbara, and I am a 1979 graduate of the California State Maritime Academy. I currently hold an unlimited 2nd Mate's license in the United States Merchant Marines, and I would like to offer some points of insight based on my years of experience as a watch standing navigation and cargo officer on West Coast tankers.

I did not have any prepared statements; instead, I have tried to respond to some of the points that have come up in today's hearing so I hope you will bear with me if I am a little disjointed.

Point 1, the human element. Earlier on, there was a point made of requiring on-board state-of-the-art navigational aids. As one of my old navigation instructors often informed us, the most important navigational aid on the bridge of a ship is the Mark One eyeball. It is just the brains and bodies functioning behind those eyballs that are becoming the subject of greater fatigue, stresses, and strains due to a a number of factors; many of them tied to the economic plight of the American Merchant Marine.

One such example is the watch standing structure. Current Coast Guard and International Maritime Organization (IMO) regulations call for three watches for three mates -- 4 on and 8 hours off, watch routine. Currently in the Merchant Marine, this procedure is being changed as the vessel is coming into port. As the vessel comes into port, it has to do a lot more work. I should explain the ranks: There is a master, a chief officer, a second officer, and two 3rd officers stand the navigation watches. With the hardships that have come on, they have eliminated the second 3rd officer, and they have inserted the chief mate in the watch rotation.

This is all well and good if he stands his watch. Unfortunately, when you come on coast, the chief mate has a greatly increased workload. This has led, while still on the roster as maintaining a three-mate rotation, to the second and third officer relieving each other, standing 6 on and 6 off. Once again, you are stressing the people far beyond their limits, and this is going on, depending on where you are on the coast, for several weeks without end.

Another problem that is faced is decision making at sea. In the oil business paychecks pull the strings; and when you have someone making a decision who has their paycheck show up from the oil companies, then their prime concerns are going to become a little clouded; and if safety conflicts with their own job, where do their loyalties lie? If they vote for safety, who is going to take care of their mortgage payments?

This may come into play in issues such as loading and discharge regulations. Also when you have a salvage situation - we have been talking about disabled vessels off the coast. There are numerous instances in maritime history where masters have actually procrastinated to the point where letting their ships go around in order to not let their vessels be taken as salvage, and hopefully, wait for a tug on a contract to show up. There is a very big difference. If a tug contracts to tow, you will pay them a set fee. If someone comes and salvages your vessel, they basically own your

vessel. There is a great economic disincentive to let someone have salvage regardless of how desperate the situation. Once again, the people making these decisions at refineries, on ships, and throughout this industry have two bosses: safety and work considerations, and they have the fact that they have to keep their job.

Earlier there was some talk about radios, who participates, who responds, and so forth. I have found that on the West Coast about two-thirds of the time you call somebody you can get to an answer. If you know who you are calling, if you can identify them, you can get a response. Other areas of the country, it is much worse. One concern I have currently is in the Gulf Coast. The radio channels are currently a nightmare. On the prime navigation and emergency channels, Channel 16 and so forth, you have basically, well, I won't describe who they are, but you have people broadcasting country and western music, telling jokes, and just about carrying on their radio DJ programs on the navigation frequency. This has not gotten that bad on the West Coast, but the influx of crew boats, supply boats, and so forth, coming from the Gulf, may very well change that situation.

Once again, back to the subject of radios and collision avoidance in general, the rules of the road, radio traffic are designed for intership - ship to ship. When you run into a situation when you have four to five different ships, perhaps it is nighttime so you are not able to identify which ship you are calling, you start to play a game running between the radar and the radio set to see who I am talking to, give him a bearing back and forth, it can become a very confusing situation very quickly, and that can add to a lot more stress.

Point 2 gets into traffic. There has been a lot of talk about the traffic lanes off the coast. There has been very little talk about the traffic separation, or the precautionary zone at Pt. Conception and Pt. Arguello. The traffic lanes basically end at Pt. Conception, and there you transit from a very rational, ordered, divided traffic flow into a helter skelter transit area where everybody splits. You have traffic coming from the north, from the Far-East, from Alaska, and you have traffic leaving the Los Angeles Basin and coming out of the traffic lanes. Everybody is going his own way and there is no control, no guidance in this area. This is just the area that a lot more rigs are getting put in right now.

That gets into another area of rules of the road, traffic separation schemes, and how they conflict with the laws of physics from time to time. We heard people talking of smaller vessels and bigger vessels.

It takes a long distance to stop a ship, and that is if you are prepared to do it. Usually the vessels operating the Channel are operating at sea speed, which means that their engineering plants are turned up for maximum efficiency, and they cut in extra burners if they have got boilers, or they have got it down into a routine for high speed long distance running. If you have to maneuver, you have to come out of that and then down into your maneuvering mode and then try to stop your vessel. Correspondingly, if you are entering port, you are also going to be maneuvering. This is the time that the most engineering casualties take place, when you are making changes in your engineering plant. Safety zones are very nice unless the vessel loses power. I have been on a 70,000-pound tanker that lost power off of Pt. Reyes. We were seven miles off of Pt. Reyes; the vessel had about 5 degrees

left rudder; there was no way to even move that without going through a long laborious process of relieving the gear, and essentially, we would end up coming to a dead stop on a calm day three miles off of Pt. Reyes, facing the opposite direction. We just made one very long run. So a thousand-yard safety zone is not going to do you a whole lot of good if you have a casualty of any sort. These vessels carry on for a tremdnous distance.

Point 3, spills. No one so far in the chemical dispersant studies had mentioned the most common chemical dispersant used in the oil industry today, and I am talking about liquid dishwashing soap. Lemon Fresh Joy comes into mind. You will very rarely find a tug, workboat, or any other vessel that does not carry some of this stuff for their handy little spills if something goes wrong. You find very great reluctance to report spills, accidents, or anything that may reflect on the license, the character, or the job holding abilities of the people involved in it. And the oil companies are not very pleased, especially when you have such massive publicity made about incidents. Understandings can be arranged, especially when paychecks tend to pull the strings.

Point 4, bilge and tank cleaning. Fifty miles offshore everybody opens up their bilge systems and pumps the junk over the side. Also tank cleaning is being conducted regularly outside the exclusion zone. What this has the effect of doing is creating certain locals of offshore sewers, because everybody opens up their bilges there and everybody closes down their pumping there. So the object is to get as much out before you get into the exclusion zone; and as soon as you clear the exclusion zone outbound, pump it all over the side and clean it out. I have actually been on ships that in order to do this, there are certain regulations that you can only pump out so much per such and such a mile ... and I have been on ships that have actually gone out and spun doughnuts in the ocean, like 2-mile squares, in order to comply. This is not altogether uncommon.

Point 5, port authorities. I think there is a tremendous need for Santa Barbara County to realize that it has one of the finest open water roadsteads anywhere, and certainly the best on the West Coast sitting right out there. A roadstead is basically an open area of fairly calm water where anchorages, and so forth, are quite accessible. There is a definite possiblity that once they have their foot in the door, that the marine terminals will open up this area as a port, and for the good of the United States perhaps that is necessary. However, no one has looked at this, at the benefits of developing a port authority such as Port Hueneme and Port San Luis have both done. It gives you greater regulatory control. Perhaps Mr. Sollen's committee could be organized under a port authority. It allows you to gain revenues from the moving of cargo over your docks. It gives you an economic and a legal reason to butt your nose beyond the limits of the shore, if this is your port.

Currently, the size of tankers is primarily a reflection of the ports into which they can get. They can only have a certain draft. Some of them, particularly in San Francisco Bay, have to lighten to another vessel inside San Francisco Bay, and then move off to pump off at the refinery. With an offshore mooring such as you have in Santa Barbara, there is a possibility that instead of scaling the tankers down to the size of the port, the tankers could move up to a much larger scale, which could be accommodated in a roadstead.

We have heard a lot of expert testimony about how things are supposed to be. Well, I have

worked among the laborers, and I am here to tell you that it is quite a bit different. Fire drills, mostly, become rituals. Lifeboat drills have a similar type nature. They do not really get into the ways we would really deal with a particular emergency. The inspectors we usually have know less about it than the people I have working under me on deck. They are coming down with a checklist that someone has made up for them, and they look at something and they check, check, check. There is a need for the training of inspectors to increase their ability to independently go out there and regulate. I do think there is a tremendous need for inspectors.

Inert gas systems. An inert gas system is great if it's working, and it is also great if it does not get breached. If you have a collision, even a small boat colliding with a tanker, you have just breached your inert gas system, and you are back to an explosive atmosphere. I have never met a working vapor recovery system. If you do not have such a system, and Port San Luis is such an example, you can get vapors running along the water line, and pleasure boats can ignite these fumes.

I would suggest that inspectors, and those in charge of enforcing regulations, be trained to a higher standard, and that the oil industry does not supervise itself or pay those who supervise them. There is a great need for a Port Authority in this area to give a continuous and on-top-of-it regulatory control.

SENATOR MARKS: I am among other things the Chairman of the Committee on the Maritime Industry. It is a pleasure to hear from you. I think we should hear from more people who are in the maritime industry as to the problems of the maritime industry, and I am very glad that you were here. One of the problems of the maritime industry is that not all the ships are built in the United States.

CHAIRMAN HART: Our next and last public witness is Geoff Chung, Ph.D., who is concerned with the campus' interactions with offshore oil and gas development.

DR. GEOFFREY CHUNG: My name is Geoff Chung, and I am the interim manager of the campus' Environmental Health and Safety Office. I would like to offer some closing comments about disaster planning in general.

Because of the University's proximity and unique proximity to platform Holly, and the pending expansion of the offshore oil and gas operations along our coastline, we have a campus community and sensitive environments that could be exposed to deleterious effects arising from:

1. A major oil spill arising from a platform well blowout, or tanker in transit or loading operation.
2. A tanker or platform fire or explosion.
3. A sudden or accidental release or venting of gases into the atmosphere, either at toxic or at nuisance levels.

I have surmised from today's hearing that coordination and mobilization for a reasonable and timely notification and response to any of these scenarios are quite limited at this time. We would like to see assurances, either from legislative action or administrative action and enforcement that we will have guaranteed support and assistance from the private oil sector, Federal, local, and State agencies. There should be a local comprehensive and functional contingency plan that will involve

timely notification and appropriate response for the campus to minimize destruction of our preserves and coastline, to minimize damage and setbacks to a lot of vital academic marine research projects, and to minimize any hazardous exposures to our campus populations.

Our office is currently in the process of drafting a contingency plan to address air quality and water quality issues. It is becoming difficult at this writing to complete the interface portions of our plan with the Federal, State, and private sectors because many of them have not thoroughly completed their portions.

We would like to see a more active role in motivating proper coordinated contingency planning. Thank you.

CHAIRMAN HART: Thank you very much. I would like to make some concluding remarks if I might. First, I would like to thank my colleagues, Senator Marks and Senator McCorquodale, for bearing with us throughout this lengthy hearing today. Also, I want to mention that if anyone has additional comments to be sure to leave them with either of our two repositories over here.

Let me just mention a few of the impressions that I have. It strikes me that one of the most troublesome issues is the issue of jurisdiction. Repeatedly today, we have heard of concerns of overlap, who is in charge, and I think that is an area on which this Subcommittee needs to spend some additional time. There have been a number of suggestions in the area. It is particularly troublesome as it relates to national or international bodies because we obviously have limited or no jurisdiction as it affects those. In any case, I think any solution has to address to what extent we can become involved with national or international bodies or regulatory authorities. I do not think it is an insurmountable issue, but I do think it is a very challenging one.

We have also heard concerns about enforcement. As our last witness, as well as other witnesses have asked: How do you go about more effectively enforcing? That may be the $64,000 question. I am not sure what the answer is, but I think some better understanding of what is being implemented, and to what extent are conditions that are being imposed, or the regulations of laws being enforced is something that the Subcommittee needs to know more about.

Funding issues. A number of people made references to cutbacks in the Coast Guard, a number of our presenters, particularly affiliated with the University made strong pleas for research funds. I think these are legitimate concerns and of interest to the Subcommittee.

Two specific areas that I was interested in that I think are deserving of additional attention are questions relating to sea lanes, particularly in the western end of the Channel and around the Pt. Conception area, and also the issue of fire prevention. It seems to me that the fire prevention capability is really inadequate. I am not sure what the answer is, but it is something that is of personal concern to me.

A final area that I think is deserving of some attention by the Subcomittee is the issue of what took place in the Puerto Rican. Trying to understand that accident that occurred a year ago may give us some greater insights into what steps we can take here locally in terms of contingency planning that would strengthen whatever role we are going to be involved in in terms of trying to prevent and respond to disasters.

These are some of the comments and concerns that I have. This is really the first meeting of this Subcommittee; there will be others, and I think that this forum gives us an opportunity to move forward on soe potential legislation.

Let me again thank particularly Mr. Schuyler and the Environmental Studies Department and the people associated with the Unviersity of California for helping put on this hearing today, and a special tanks to all the participants and everyone who came forward, some people from long distances, and many people with very busy schedules to participate in this symposium. I thought it was a thoughtful hearing, and I am very pleased that everyone was able to participate. If there are not any further comments, this meeting will stand adjourned.

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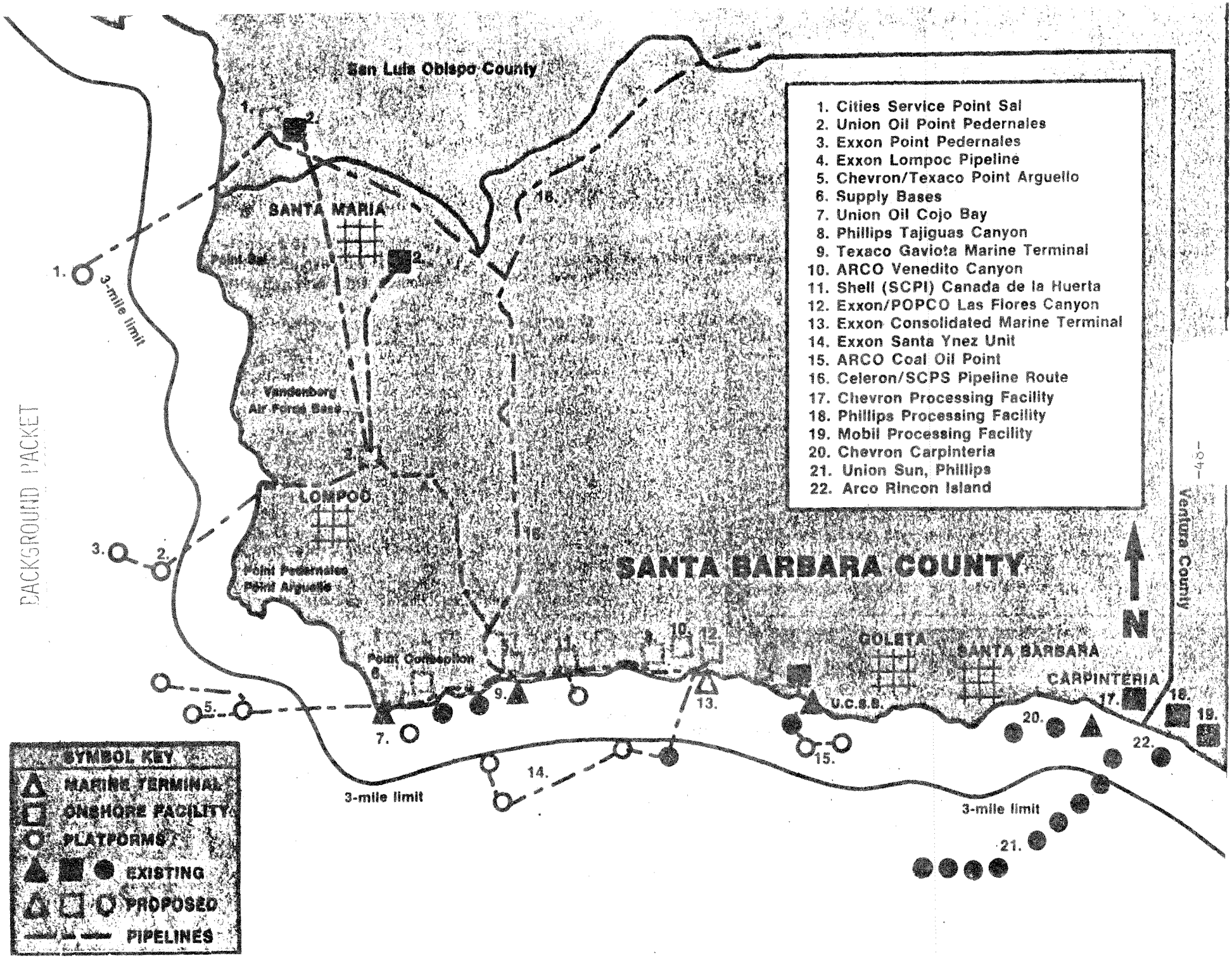

BACKGROUND PACKET

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News-Press Graphic by SONYA HOLM

SENATE SUBCOMMITTEE ON OFFSHORE OIL AND GAS DEVELOPMENT

Nov. 4, 1985: HEARING ON THE ROLE OF THE STATE IN REDUCING THE MAJOR RISKS OF OFFSHORE OIL AND GAS OPERATIONS: The Santa Barbara Channel and Santa Maria Basin as a Case Study

DEVELOPMENT IN THE REGION

In the next 20 years oil production in the Santa Barbara Channel and the Santa Maria Basin is expected to increase from the present 80,000 barrels a day to a maximum of 500,000 or more. The attached map shows the existing offshore and onshore projects that are operating now and are planned for the future. Anticipated projects include one new marine terminal and expansion of existing terminals, at least two processing plants, at least one crude oil pipeline, and a supply base. Depending on finds in the Basin, the number of platforms could double.

MARINE TRAFFIC IN THE REGION

The Coast Guard predicts a 50% increase in traffic in the Channel by 1990. This estimate presumes an increase in tanker operations, at least until the pipeline is operational, from the present 20 passages a day to approximately 30. Overall, 295 tanker loadings a year in the Channel/Basin have been estimated until pipelines are in operation. In addition, there will be 30-50 crew and work boat trips a day probably operating from a supply base in the Point Conception area and the marine terminals. Fishing boats will need to pass through and fish around the oil installations.

Over the centuries, the region has had hundreds of wrecks. However, in the last 40 years only two major shipping accidents have occurred: in 1963 the Copper State hit the Cossatot, and in 1966 the Chickasaw went aground on Santa Rosa Island. There have been no collisions of ships with oil platforms or exploratory rigs.

It is a tribute to the oil industry, regulatory agencies and sailors in the Channel and Basin that there have been very few accidents in recent years. However, a highway can take traffic for years with few accidents until a small, but critical, increase in traffic occurs; the same is true of an airport. Will the increases planned for the next 20 years in vessel operations in the region greatly increase the chance of collisions and groundings that could lead to major fires and spills?

ASSOCIATED RISKS

In 1970 the tanker Polycommander ran aground on the Spanish Atlantic coast and spilled 112,000 barrels. The spill caught fire, created a fire storm, and sent a black mist of oil and soot over coastal farms.

In 1983 the Castillo De Belver broke up and burned off South Africa, resulting in great damage to hundreds of square miles of rich coastal farmland.

In 1984 the Puerto Rican blew up as it left San Francisco and the sunken half of it is still leaking oil. Earlier that year the Sealift Pacific almost went aground off Monterey. No tug could have reached it in time, but fortunately its anchors held.

On August 2 of this year the Jan ran into a lighthouse off Denmark and spilled 1,500 barrels of heavy oil doing considerable damage to resorts and wildlife.

All of these accidents have occurred over the years in some part of the world. What is the likelihood that similar accidents could occur in this region over the next 25 years?

Among the classes of accidents that will be considered at this hearing are:

- fires and spills resulting from ship with ship collision
- fires and spills resulting from ship with platform collision
- tug, barge collision with ship or fixed platform
- fire on board ship in transit
- flooding on board ship
- emergency cargo offloading operations
- ship sinking
- emergency towing operations
- stranding of ship, barge or tug with resulting cargo loss and associated pollution
- explosion of tanker with resulting fire or sinking
- drilling unit blowout
- well control problems
- stranding of ladened barges
- break in pipelines, either offshore or on land
- accidents at onshore processing and storage facilities and from vehicles transporting hazardous oil and gas byproducts.

TECHNOLOGY

What technology is in place and proposed to prevent accidents and respond if accidents should occur? What is the best available technology?

What training is needed? Where and how does it occur?

What inspection and monitoring programs are ongoing or proposed? Are they adequate?

JURISDICTIONAL ISSUES

Who has lead agency and permit authority over development projects? Who can develop and require permit conditions designed to prevent or mitigate accidents?

In the event of accidents at sea, at the shoreline or onshore, who is in charge? What are the lines of authority and communication between federal, state and local government agencies; between the public and private sector? Who bears the cost of accidents?

RECOMMENDATIONS

This is an informational hearing, designed to gather information and recommendations from representatives of the oil and shipping industries, government officials, consultants and experts in the area of risk analysis, and from the general public as to how accidents can be prevented and risks minimized.

For example, what are reasonable and necessary preventive measures? Should they include:

- local vessel traffic control systems into and out of marine terminals?
- the use of docking masters when tankers come in?
- extension of the vessel traffic separation system or requiring that it be made mandatory?
- having an oceangoing firefighting tug permanently stationed in the region?
- employing new systems for tracking vessels?

If such measures are warranted, who has the authority to require them?

What resources are needed by local governments in the region to adequately respond in the event of accidents?

What funding sources are available, and needed?

What legislative actions should be taken to reduce the major risks of offshore oil and gas operations?

CALIFORNIA SENATE SUBCOMMITTEE HEARING ON OIL AND GAS DEVELOPMENT

NOVEMBER 4, 1985

SESSION I PROJECTED OIL OPERATIONS IN THE REGION. THE RISKS INVOLVED AND THE CONSEQUENCES OF AN ACCIDENT.

SENATOR HART, AND MEMBERS OF THE PANEL, I AM DON CORNETT, ENVIRONMENTAL CONSERVATION MANAGER FOR EXXON'S WESTERN PRODUCTION DIVISION. I APPRECIATE THIS OPPORTUNITY TO PRESENT OUR OVERALL VIEW OF THE FUTURE OIL AND GAS OPERATIONS IN THE SANTA BARBARA CHANNEL AND THE SANTA MARIA BASIN. MY PRESENTATION WILL ADDRESS THE POTENTIAL RISKS OF THESE OPERATIONS, AND THE SAFEGUARDS AND CONTROLS BEING TAKEN BY THE REGULATORY AGENCIES AND THE INDUSTRY TO MITIGATE THE CONCERNS RAISED BY ALL INTERESTED PARTIES. THESE CONCERNS HAVE BEEN RAISED BY PROJECTIONS OF THE FUTURE OF OFFSHORE DEVELOPMENT IN SANTA BARBARA COUNTY. THIS VIEWGRAPH ILLUSTRATES OUR PROJECTION OF THESE ACTIVITIES.

VG #1

FIRST, WE BELIEVE THERE WILL BE CONSOLIDATED PROCESSING FACILITIES FOR USE BY SEVERAL OIL COMPANIES ON THE SOUTH COAST. SECOND, PROCESSING FOR SOME OF THE NEW SANTA MARIA BASIN DISCOVERIES WILL OCCUR IN THE NORTH COUNTY. THIRD, MOST OF THE OIL WILL BE LEAVING THE COUNTY BY PIPELINE BOUND FOR LOS ANGELES AND TEXAS GULF COAST REFINING CENTERS. FOURTH, THERE WILL BE A MODERN, ENVIRONMENTALLY SOUND BUT POSSIBLY SELDOM-USED CONSOLIDATED MARINE TERMINAL AT LAS FLORES CANYON. FINALLY, THE EXISTING GAVIOTA MARINE TERMINAL WILL BE DISMANTLED AND THE SITE RESTORED TO ITS NATURAL STATE, ADDING TO THE COUNTY'S COASTAL ZONE OPEN SPACE INVENTORY. THIS BRIEFLY IS OUR VIEW OF THE FUTURE ONSHORE FACILITIES, REQUIRED IN SANTA BARBARA COUNTY, TO SUPPORT OFFSHORE OIL AND GAS DEVELOPMENT IN THE CHANNEL AND THE SANTA MARIA BASIN.

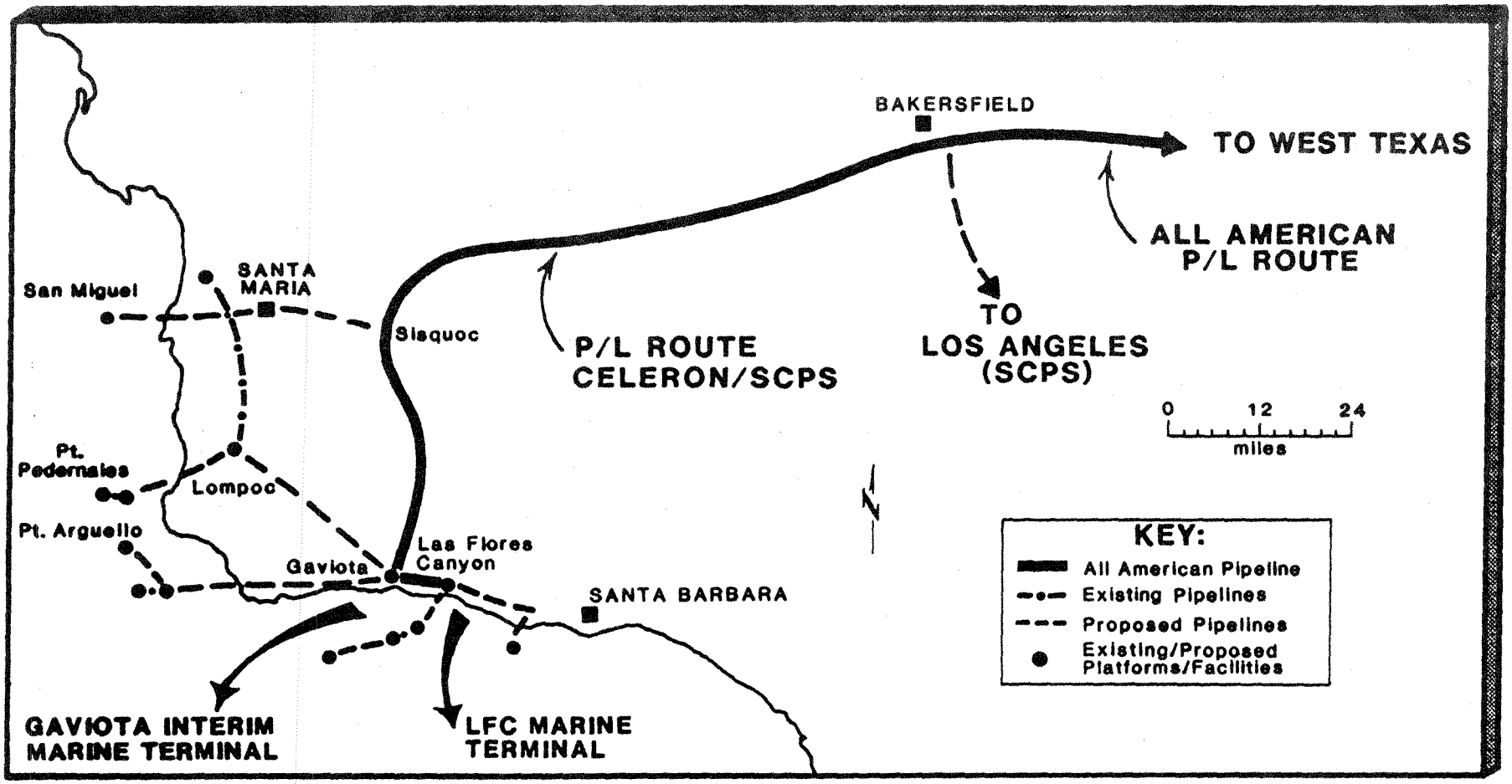
THE POTENTIAL OFFSHORE ACCIDENTS OF MOST CONCERN WOULD BE THOSE WHICH COULD RESULT IN OIL SPILLS, FIRES OR EXPLOSIONS, AND THOSE RELATED TO SHIP TRAFFIC. I'LL DISCUSS THE POTENTIAL RISKS OF THESE ACCIDENTS AND THE MEASURES BEING TAKEN BY THE INDUSTRY WORKING WITH THE REGULATORY AGENCIES TO PREVENT THEM.

BUT BEFORE I DISCUSS WHAT ACTIONS ARE BEING TAKEN BY THE AGENCIES I WOULD LIKE TO REMIND YOU THAT THE INDIVIDUAL COMPANIES ARE HIGHLY MOTIVATED, AND HAVE EXTENSIVE PROGRAMS, TO PROMOTE SAFETY IN ALL OUR OPERATIONS. SAFETY IS OUR NUMBER ONE PRIORITY AT EXXON FOR A VERY PRACTICAL REASON. ACCIDENTS NOT ONLY COST A LOT OF MONEY, THEY ENDANGER OUR MOST IMPORTANT RESOURCE, OUR PEOPLE. EVERYONE AT EXXON IS INVOLVED IN OUR SAFETY PROGRAM AND IT HAS RECEIVED TOP MANAGEMENT SUPPORT FOR MANY, MANY YEARS. THIS IS TRUE OF OTHER COMPANIES IN THE INDUSTRY.

ACCIDENTAL SPILLS OF MORE THAN A FEW BARRELS FROM OFFSHORE PRODUCTION OPERATIONS ARE UNCOMMON EVENTS. THE MOST PROBABLE SPILLS ARE THOSE THAT ARE SMALL IN VOLUME ORIGINATING FROM LEAKS, RUPTURES, EQUIPMENT FAILURES, AND HUMAN ERROR. MAJOR SPILLS ARE EXTREMELY UNLIKELY, BUT HAVE IN THE PAST ORIGINATED FROM WELL BLOWOUTS, TANKER ACCIDENTS, AND PIPELINE RUPTURES.

-54- AS A PART OF EACH EIS/EIR CONDUCTED FOR PROJECTS IN THE SANTA BARBARA CHANNEL AND SANTA MARIA BASIN, A DETAILED "SYSTEM SAFETY RELIABILITY ANALYSIS" IS PREPARED WHICH INCLUDES HOW THE PROPOSED FACILITIES WILL AFFECT PUBLIC SAFETY AND THE ENVIRONMENT. I WOULD LIKE TO STRESS TO YOU THAT THIS WORK IS NOT DONE BY THE COMPANIES, BUT IS DONE BY THE EXPERTS SELECTED AND EMPLOYED BY THE AGENCIES ON THE JOINT REVIEW PANEL. THESE ARE NOT EXXON'S NUMBERS, BUT THE NUMBERS THAT ARE DEVELOPED BY THOSE EXPERTS. THE DOCUMENT IN MY HAND IS THE RESULT OF THAT WORK FOR THE SANTA YNEZ/LAS FLORES CANYON PROJECT IN THE SANTA BARBARA CHANNEL. IT COST CLOSE TO $300,000.

FUTURE ONSHORE DEVELOPMENT
SANTA BARBARA COUNTY



VG #2

THIS VIEWGRAPH, ENTITLED "EXAMPLES OF OFFSHORE OIL SPILL HAZARDS" IS TAKEN FROM THE EIS/EIR FOR THE CENTRAL SANTA MARIA BASIN. WHILE IT IS SPECIFIC TO THE UNION AND EXXON PROJECTS, IT HELPS TO PLACE IN PERSPECTIVE THE MINIMAL RISKS OF AN OFFSHORE SPILL REACHING THE SHORELINE AND CAUSING SIGNIFICANT ENVIRONMENTAL IMPACT.

THE TABLE SHOWS SEVEN POTENTIAL ACCIDENTAL EVENTS WITH THE CORRESPONDING SPILL VOLUME AND THE LIKELIHOOD OF THE SPILL CONTACTING THE COASTLINE. IT SHOWS THAT OIL SPILLS OF UP TO A FEW HUNDRED BARRELS MAY BE CAUSED BY A VARIETY OF EQUIPMENT FAILURE ACCIDENTS, BUT THAT THE FREQUENCY OF THE SPILL REACHING THE SHORE IS CLASSIFIED AS RARE. ON THE OTHER HAND, THE CHART SHOWS THE LARGER SPILLS WOULD PROBABLY BE CAUSED BY WELL BLOWOUTS WITH THE FREQUENCY OF THE SPILL REACHING SHORE CLASSIFIED AS UNLIKELY TO RARE (RANGING FROM ONCE IN 4,100 YEARS TO ONCE IN 11,000 YEARS). THE RISK OF AN OIL SPILL EVER REACHING THE COASTLINE ARE BROUGHT INTO PERSPECTIVE WHEN YOU CONSIDER THAT THE TYPICAL OIL PROJECT LIFE IS ON THE ORDER OF 30 YEARS.

OIL SPILL CONTINGENCY PLANS ARE PREPARED FOR EACH OFFSHORE PROJECT. THESE PLANS DESCRIBE THE ORGANIZATION, EQUIPMENT AND PROCEDURES FOR IMPLEMENTATION BY A RESPONSE TEAM TO REPORT, CONTAIN, AND CLEAN UP POTENTIAL OIL SPILLS. THE PLANS ARE REVIEWED INITIALLY BY THE U.S. COAST GUARD, THE CALIFORNIA COASTAL COMMISSION AND THE MMS. ONCE APPROVED THE PLANS ARE REVIEWED AND UPDATED ANNUALLY.

EXAMPLES OF OFFSHORE OIL SPILL HAZARDS

ACCIDENTAL EVENTS	SPILL VOLUME (bbl)	FREQUENCY (YEARS) OF CONTACTING COASTLINE
BLOWOUT	1,000 - 10,000	ONCE IN 4,100 (unlikely)
	10,000 - 100,000	ONCE IN 5,700
	100,000 OR MORE	ONCE IN 11,000 (rare)
SEPARATOR RUPTURE	120	ONCE IN 48,000 (rare)
PIG RECEIVER (10 min.)	140	ONCE IN 83,000 (rare)
PLATFORM IRENE COLLAPSE	2,500	ONCE IN 910,000 (rare)
OIL PIPELINE RUPTURE - MIDWAY TO SHORE	8,400	ONCE IN 16,000 (rare)
INTERPLATFORM PIPELINE RUPTURE	UP TO 1,250	ONCE IN 45,000 (rare)
SPILL FROM MARINE TRAFFIC PRECAUTIONARY ZONE	**	THREE PERCENT OF ALL SPILLS ARE EXPECTED TO REACH LAND

THE FEDERAL AND STATE AGENCIES HAVE A THREE-LEVEL RESPONSE PHILOSOPHY FOR COPING WITH OIL SPILLS. THE FIRST LEVEL IS AN IMMEDIATE RESPONSE UTILIZING THE OPERATOR'S EQUIPMENT ON THE PLATFORM. THIS EQUIPMENT (CONSISTING OF BOOMS, SMALL BOATS, SKIMMERS, SORBENTS, ETC.) WILL HANDLE SPILLS OF UP TO ABOUT 20 BARRELS. THE SECOND LEVEL OF RESPONSE INCLUDES THE OIL SPILL COOPERATIVE, CLEAN SEAS INC., AND OTHER NEARBY COOPERATIVE ORGANIZATIONS AND OUTSIDE CONTRACTORS. THESE RESOURCES CAN HANDLE OIL SPILLS OF UP TO 10,000 BARRELS OR MORE. THE COOPERATIVE ORGANIZATIONS ARE ON 24-HOUR ALERT AND HAVE EQUIPMENT PRE-POSITIONED FOR RAPID DEPLOYMENT AT VARIOUS POINTS ALONG THE COASTLINE TO PROTECT ENVIRONMENTALLY SENSITIVE AREAS.

THE CALIFORNIA COASTAL COMMISSION HAS RECENTLY REQUIRED THAT THIS SECOND LEVEL OF RESPONSE TAKE NO MORE THAN ONE HOUR. FOR COMPLIANCE, CLEAN SEAS, INC. PLANS TO ASSIGN A WELL-EQUIPPED SPILL RESPONSE VESSEL, 180 FEET IN LENGTH, FOR SPECIFIC DUTY IN THE POINT ARGUELLO/POINT PEDERNALES AREA. ADDITIONAL EXISTING SPILL RESPONSE VESSELS OPERATED BY CLEAN SEAS, INC. ARE CAPABLE OF REACHING THIS AREA WITHIN FOUR TO EIGHT HOURS OF NOTIFICATION.

FOR LARGER SPILLS, THE THIRD LEVEL OF RESPONSE INVOLVES THE U.S. COAST GUARD STRIKE TEAM. THIS RESPONSE LEVEL CAN BE CALLED UPON IF THE NEED FOR MORE EXTENSIVE RESOURCES EVER ARISES.

B-7

ONE EXAMPLE OF THE CARE THAT IS TAKEN TO PREVENT ACCIDENTS AND THE RESULTS OF THESE EFFORTS IS EXXON'S EXPERIENCE AT HONDO, IN THE SANTA BARBARA CHANNEL. WHEN WE STARTED UP THE HONDO OPERATION IN 1981, WE DOUBLED CALIFORNIA'S DAILY OFFSHORE OIL PRODUCTION. HONDO HAS ONE OF THE HIGHEST PRODUCING RATES OF ANY PLATFORM. YET, AFTER PRODUCING OVER 56 MILLION BARRELS OF OIL, WE HAVE SPILLED ABOUT 5 BARRELS ~~OF OIL~~. BY COMPARISON, THE NATURAL SEEPS JUST OFFSHORE, NEAR THE UNIVERSITY, ARE ESTIMATED TO DISCHARGE MORE THAN THAT EVERY ~~[redacted]~~ HOUR ~~[redacted]~~. HONDO IS AN EXCELLENT EXAMPLE OF HOW GOOD PLANNING AND DESIGN, COUPLED WITH CAREFUL OPERATIONS, CAN RESULT IN SAFE PRODUCTION OF THE OIL AND GAS THAT IS VITAL TO OUR ECONOMY.

POTENTIAL SOURCES OF ONSHORE SPILLS

SPILL LOCATION	SPILL SIZE (BBL)	FREQUENCY (YEARS)
ONSHORE OIL PIPELINES (LANDFALL TO LOMPOC)	100 OR MORE	ONCE IN 170 (UNLIKELY)
	1,000 OR MORE	ONCE IN 1,700 (UNLIKELY)
	10,000 OR MORE	ONCE IN 2,200 (UNLIKELY)
LOMPOC FACILITY	100 OR MORE	ONCE IN 1,800 (UNLIKELY)
	1,000 OR MORE	ONCE IN 2,800 (UNLIKELY)
	50,000 OR MORE	ONCE IN 25,000 (RARE)
ONSHORE OIL PIPELINES (LOMPOC TO ORCUTT)	100 OR MORE	ONCE IN 56 (LIKELY)
	900 OR MORE	ONCE IN 560 (UNLIKELY)
	1,800 OR MORE	ONCE IN 1,100 (UNLIKELY)
ORCUTT FACILITY	100 OR MORE	ONCE IN 100,000 (RARE)

VG #3

THIS CHART WAS ALSO PREPARED AS PART OF THE EIS/EIR FOR THE UNION AND EXXON PROJECTS. IT SHOWS THE POTENTIAL SOURCES OF ONSHORE SPILLS WITH THE CORRESPONDING VOLUMES AND THE FREQUENCY. THE MOST LIKELY SPILL OF 100 TO 900 BBL WOULD BE FROM A PIPELINE AND OCCURRING ONCE IN 56 YEARS. LARGER PIPELINE SPILLS ARE SHOWN TO BE UNLIKELY RANGING FROM ONCE IN 107 YEARS TO 2,200 YEARS. THE POSSIBILITY OF A SPILL LARGER THAN 100 BBL OCCURRING AT THE PROCESSING FACILITIES RANGE FROM UNLIKELY TO RARE (ONCE IN 1,800 YEARS TO ONCE IN 100,000 YEARS).

VG #3A

THE REGULATORY AGENCIES REQUIRE A NUMBER OF MITIGATION MEASURES TO OFFSET THE POTENTIAL FOR ONSHORE SPILLS OF ALL TYPES:

- THE ENVIRONMENTAL PROTECTION AGENCY REQUIRES SPILL PREVENTION, CONTAINMENT AND COUNTERMEASURE PLANS FOR ALL ONSHORE FACILITIES. THESE PLANS SERVE THE SAME PURPOSE AS THE OIL SPILL CONTINGENCY PLANS REQUIRED FOR OFFSHORE OPERATIONS BY THE MMS.

- IN ADDITION TO MEETING THE FEDERAL AND STATE STANDARDS FOR CONSTRUCTION AND OPERATION OF PIPELINES, SANTA BARBARA COUNTY HAS ADDED SEVERAL REQUIREMENTS: (1) A SYSTEM SAFETY REVIEW OF ALL OIL DEVELOPMENTS TO ENSURE THE BEST POSSIBLE DESIGN OF FACILITIES, (2) THE ADDITION OF ONSHORE ISOLATION VALVES AT STRATEGIC LOCATIONS ON PIPELINE ROUTES, (3) CONTINGENCY PLANS FOR SPILLS FROM ONSHORE PIPELINES, (4) DELUGE SYSTEMS TO CONTROL FIRES AT CERTAIN TYPES OF STORAGE TANKS AND TRUCK LOADING, (5) SPECIALIZED EMPLOYEE TRAINING PROGRAMS AND OTHER PROJECT-SPECIFIC AND SITE-SPECIFIC CONDITIONS TO ADDRESS THE POTENTIAL ACCIDENT SITUATIONS ORIGINATING FROM ONSHORE PIPELINES AND FACILITIES.

MITIGATION REQUIREMENTS FOR POTENTIAL ONSHORE SPILLS

AGENCY	REQUIREMENTS
EPA	SPCC PLANS
FEDERAL AND STATE	CONSTRUCTION AND OPERATION STANDARDS
SANTA BARBARA COUNTY	SYSTEM SAFETY REVIEW
	ISOLATION VALVES
	PIPELINE CONTINGENCY PLANS
	DELUGE SYSTEMS
	TRAINING PROGRAMS

THE OTHER MAJOR CONCERN REGARDING POTENTIAL ACCIDENTS IS ASSOCIATED WITH TRANSPORTATION. WITH REGARD TO OFFSHORE TRANSPORTATION RISKS AND MITIGATION MEASURES, I'LL NOW ADDRESS SHIPPING. THE RISKS ASSOCIATED WITH OFFSHORE PIPELINES HAVE ALREADY BEEN DISCUSSED. YOU MAY RECALL THAT THE RISK OF A PIPELINE RUPTURE MIDWAY TO SHORE FROM THE UNION/EXXON DEVELOPMENT IN THE SANTA MARIA BASIN HAS BEEN CLASSIFIED AS RARE, OR ONCE IN 16,000 YEARS.

VG #4

THE INFORMATION ON THIS CHART IS TAKEN FROM THE SYSTEM SAFETY AND RELIABILITY ANALYSIS FOR THE SANTA YNEZ UNIT. IT SHOWS A SUMMARY OF POTENTIAL EVENTS WHERE SPILLS COULD BE CAUSED BY TANKER TRANSPORTATION. THE FREQUENCY OF THE FIRST FOUR EVENTS, A SHIP-TO-PLATFORM COLLISION, SHIP-TO-LOADING FACILITY, TANKER ACCIDENT WHILE UNDERWAY, AND TANKER ACCIDENT WHILE LOADING, RANGE FROM RARE (EVENTS THAT HAVE OCCURRED ON A WORLD BASIS, BUT ONLY A FEW TIMES) TO UNLIKELY TO OCCUR DURING THE LIFE OF THE PROJECT. THE ONLY LIKELY SPILL WOULD BE ONE OF UP TO A MAXIMUM OF 500 BBL CAUSED BY A TANKER LOADING FAILURE.

POTENTIAL SPILLS CAUSED BY TANKER TRANSPORTATION

EVENTS	MAXIMUM SPILL SIZE (Barrels)	FREQUENCY GROUP
SHIP-TO-PLATFORM COLLISION	500,000	RARE
	15,000	UNLIKELY
SHIP-TO-LOADING FACILITY	475,000	RARE
	30,000	UNLIKELY
TANKER ACCIDENT WHILE UNDERWAY	385,000	RARE
	30,000	UNLIKELY
TANKER ACCIDENT WHILE LOADING AND LOADING FAILURE	10,000	RARE
	1,000	UNLIKELY
	500	LIKELY

VG #5

TO PLACE THESE HYPOTHETICAL EVENTS IN PERSPECTIVE, THIS NEXT CHART COMPARES THE LARGEST RECORDED CRUDE OIL SPILLS FOR UNITED STATES FLAG TANKERS AND DOMESTIC ONSHORE PIPELINES FROM 1975 TO 1983. THIS TABLE, WHICH IS BASED ON OFFICIAL UNITED STATES DEPARTMENT OF TRANSPORTATION STATISTICS, SHOWS THE LARGEST CRUDE OIL SPILL FROM A UNITED STATES FLAG TANKER WAS AN 833 BARREL EVENT IN 1980. IN CONTRAST, THE LARGEST CRUDE OIL SPILL FOR A DOMESTIC ONSHORE PIPELINE WAS A 110,000 BARREL EVENT IN 1983.

LARGEST RECORDED CRUDE OIL SPILL BY YEAR FOR UNITED STATES FLAG TANKERS AND DOMESTIC ONSHORE PIPELINES FROM 1975 TO 1983

YEAR	TANKERS[1] Barrels	PIPELINES[2] Barrels
1975	10	15,000
1976	191	9,271
1977	40	10,500
1978	107	10,000
1979	300	25,200
1980	833	25,000
1981	20	6,400
1982	20	20,000
1983	274	110,000

[1] U.S. Coast Guard, 1984

[2] Materials Transportation Bureau, 1984

VG #6

THIS NEXT CHART IS OF INTEREST BECAUSE IT COMPARES THE NUMBER OF OIL SPILLS PER BILLION TON MILE OF CRUDE CARRIED BY DOMESTIC TANKERS AND BARGES WITH DOMESTIC PIPELINES. IT SHOWS A GOOD RECORD BY BOTH MODES OF TRANSPORT, BUT IT ALSO HIGHLIGHTS THE SUPERIOR AND STEADILY IMPROVING RECORD OF WATER CARRIERS; ESPECIALLY SINCE THE PASSAGE OF THE PORT AND TANKER SAFETY ACT IN 1978. THIS STATUTE ESTABLISHED STRINGENT CONSTRUCTION STANDARDS FOR NEW UNITED STATES FLAG TANKERS WHICH INCLUDE SPECIAL SPILL PREVENTION DESIGN STANDARDS.

NUMBER OF CRUDE OIL SPILLS PER BILLION TON/MILES TRAVELLED FOR DOMESTIC WATER CARRIERS AND PIPELINES FROM 1975 TO 1982

YEAR	WATER CARRIERS[1,2]	PIPELINES[1,3]
PRIOR TO PORT AND TANKER SAFETY ACT		
1975	3.13	0.48
1976	3.25	0.42
1977	2.23	0.43
AFTER PORT AND TANKER SAFETY ACT		
1978	0.69	0.41
1979	0.47	0.37
1980	0.30	0.34
1981	0.23	0.29
1982	0.16	0.30

1 Association of Oil Pipe Lines, 1984
2 U.S. Coast Guard, 1984
3 Materials Transportaion Bureau, 1984

VG #7

NUMEROUS OTHER MITIGATING MEASURES FOR OFFSHORE TRAFFIC ~~HAVE ALSO BEEN~~ ARE ALSO BEING IMPLEMENTED.

- THE TRAFFIC SEPARATION SYSTEM HAS BEEN OPERATING SUCCESSFULLY SINCE IT WAS INTRODUCED IN 1968. ITS EXTENSION THROUGH THE SANTA MARIA BASIN IS UNDER STUDY BY THE U.S. COAST GUARD.

- PLATFORM AND LOADING FACILITY SAFETY ZONES ARE ESTABLISHED WITH THE NORMAL PRACTICE BEING 500 METERS IN RADIUS ENCIRCLING EACH PLATFORM AND LOADING FACILITY.

There will be

- RADAR SURVEILLANCE OF SHIPPING TRAFFIC FROM KEY ONSHORE AND PLATFORM LOCATIONS.

Other requirements are:

- STATE OF THE ART NAVIGATIONAL AIDS ON TANKERS AND PLATFORMS ~~is required~~.

- COMPULSORY TRAINING PROGRAMS FOR TANKER CREWS.

- ADHERENCE TO NATIONAL TANKER LOADING PRACTICES.

MITIGATION MEASURES FOR OFFSHORE TANKER TRAFFIC AND OPERATIONS

- TRAFFIC SEPARATION LANES
- PLATFORM AND LOADING FACILITY SAFETY ZONES
- RADAR SURVEILLANCE
- NAVIGATIONAL AIDS
- SEGREGATED BALLAST TANKS
- TRAINING PROGRAMS
- NATIONAL TANKER LOADING PRACTICES

OTHER POTENTIAL RISKS HAVE ALSO BEEN IDENTIFIED AND ADDRESSED IN DETAIL BY THE SYSTEM SAFETY RELIABILITY SECTION OF THE ENVIRONMENTAL DOCUMENT. THESE ARE NOT CONSIDERED TO BE MAJOR RISKS. BRIEFLY, THEY ARE:

VG #8

- AIR TRAFFIC HAZARDS - THERE ARE NO SIGNIFICANT AIR TRAFFIC HAZARDS TO THE SAFETY OF OFFSHORE PLATFORMS.

- MILITARY AND SPACE TRAFFIC - IS CONSIDERED TO PRESENT A HAZARD TO PLATFORMS IN THE SANTA MARIA BASIN BECAUSE OF THE PROXIMITY TO VANDENBERG AIR FORCE BASE; HOWEVER, THE FREQUENCY OF OCCURRENCE IS CONSIDERED A RARE EVENT AND SPECIAL PRECAUTIONS ARE BEING REQUIRED ON THE PLATFORMS IN THAT AREA.

- ROAD HAZARDS - THE TRANSPORTATION OF NATURAL GAS LIQUIDS AND MOLTEN SULFUR HAVE BEEN STUDIED. IT HAS BEEN CONCLUDED THAT AN NGL SPILL FROM A TANKER TRUCK IS UNLIKELY. AS MITIGATION FOR POTENTIAL NGL SPILLS, STUDIES ARE UNDERWAY BY SANTA BARBARA COUNTY TO EVALUATE THE FEASIBILITY OF TRANSPORTING NGL'S BY CRUDE OIL PIPELINE. IT HAS ALSO BEEN CONCLUDED THAT AN ACCIDENT INVOLVING A TANKER TRUCK OF MOLTEN SULFUR WILL NOT PRESENT A HAZARDOUS CONDITION TO THE PUBLIC.

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OTHER RISKS

- AIR TRAFFIC HAZARDS
- MILITARY AND SPACE HAZARDS
- ROAD HAZARDS
- FACILITY HAZARDS
- SEISMIC RISKS
- SABOTAGE HAZARDS

- FACILITY HAZARDS - OFFSHORE FACILITY HAZARDS PROBABLY WOULD NOT AFFECT PUBLIC SAFETY BECAUSE OF THEIR DISTANCE FROM SHORE AND THE SAFETY ZONES ESTABLISHED. THE WORST CASE RELATIVE TO PUBLIC SAFETY IS THE RUPTURE OF A GAS PIPELINE CLOSE TO HIGHWAY 101 OR AT A LANDFALL NEAR STATE BEACHES. THE FREQUENCY OF SUCH AN EVENT IS ALSO CLASSIFIED AS UNLIKELY.

- SEISMIC RISKS - ALL FACILITY DESIGNS AND STRENGTH LEVEL EARTHQUAKE CRITERIA ARE REQUIRED TO BE CHECKED BY AN INDEPENDENT THIRD PARTY, CERTIFIED VERIFICATION AGENT, TO VERIFY THAT THE DESIGN CRITERIA PROPOSED ARE APPROPRIATE AND THAT THEY ARE MET. THIS MITIGATION IS IN PLACE TO ENSURE THAT THERE IS NO SIGNIFICANT RISK TO THE PUBLIC OR ENVIRONMENT FROM THE DESIGN LEVEL EARTHQUAKE.

- SABOTAGE HAZARDS - ALL FACILITIES HAVE A SECURITY PLAN FOR PHYSICAL PROTECTION TO REDUCE THE POSSIBILITY OF AN INCIDENT WITH AN ADVERSE ENVIRONMENTAL IMPACT.

C1

HEARING OF THE STATE OF CALIFORNIA
Subcommittee, Oil and Gas Development
Senator Gary K. Hart

and

The University of California at
Santa Barbara

"THE ROLE OF THE STATE IN REDUCING THE MAJOR RISKS OF OFFSHORE OIL AND GAS OPERATIONS: THE SANTA BARBARA CHANNEL AND THE SANTA MARIA BASIN AS A CASE STUDY"

Testimony presented by:

David H. Anderson, President
Get Oil Out Inc. (GOO)
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November 4, 1985

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Good morning. I am David H. Anderson, President of Get Oil Out Inc., more often known as GOO. I appreciate this opportunity to appear before you today, and want to thank you for scheduling this hearing in Santa Barbara.

GOO, a citizens action group of approximately 1,000 members, was founded at the time of the 1969 Santa Barbara oil spill and has (without interruption) monitored offshore oil development in the Santa Barbara area for nearly 17 years. Our policy has been to seek protection of our air quality, strict oil pollution liability regulations, the utilization of the 'Best Available Technology' at all times, and to ensure that all oil developed in this area is accomplished with minimal environmental damage.

The witnesses who have testified before me have shown you how the Santa Barbara Channel and the Santa Maria Basin are being literally overwhelmed with a flood of oil - oil to be produced, processed and transported in this area. Faced as we are with an increase of almost 1,000 % in oil production, Santa Barbara County is on its way to becoming one of the major oil centers of the contiental United States. This is something most of us have never wanted, and something which at best is going to be difficult to live with.

One of GOO's greatest concerns has been that offshore oil be developed safely. We are the first to admit that the

imposition of rigid operational regulations by the federal government has dramatically reduced the possibilities of another blowout here such as that which occurred in the channel in 1969. C3

Statistics released by Minerals Management Service in 1984 revealed that since 1970 only 791 barrels of oil had been lost on the OCS due to blowouts, an amount equal to 0.05% of all our OCS production from 1970 through 1983.

A report released by the Coastal Commission, also in 1984, revealed that in the period 1976-1983 there were 98 small spills off the coast of Southern California from oil production. Seventy-six of those spills occurred in the Santa Barbara Channel. Information for the report was obtained from the U.S. Coast Guard and Minerals Management Service.

What this means is that in spite of improved safety procedures, stricter operational regulations, and improved training of personnel, we continue to have oil spills both in state and federal waters. And all spills are not on the OCS as evidenced by the report of a spill of 300 gallons of crude from state Platform Hilda in August 1984.

It also indicates that as long as there is any human element involved in oil operations there will be operational accidents and spills. Since the beginning GOO has worked for improved training qualifications for all offshore workers, and we shall continue to do so in the future.

We want to impress upon you that each small spill that occurs is a potential large spill, and that sooner or later

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the law of probabilities will see that a large, catastrophic spill is going to happen here.

During the same 13 year period that only 791 barrels of oil was spilled in the OCS from blowouts, 2,500,000 barrels of oil were dumped into U.S. waters from oil tanker operations and collisions - or 80% of the total amount of oil spilled into our waters during the reporting period.

Put another way: Coast Guard figures indicate a total of 429 tanker spills in U.S. waters during 1981, and a similar number during 1982. Spillage amounted to 53.6% of the total amount of petroleum spilled during the period in U.S. waters. Tank barges during the same time spilled another 24.2% of total petroleum spilled, again bringing the total spillage for marine operations to about 80% (77.8%).

From these statistics, one easily comes to the conclusion that our greatest threat locally comes from tanker operations and not from the platforms themselves.

A possible collision between a tanker loaded with 400-500,000 barrels of oil, and an oil platform and/or a drilling rig would cause a spill far greater than the 1969 spill. Such collisions do occur as evidenced by records showing seven rammings of oil platforms in the Gulf of Mexico from 1971 to 1983.

A report done by A. H. Schuyler of UCSB in 1983 for Senator Hart estimated the total cost of such an accident as we described

at $636 million of which $350 million would be cleanup costs and other expenses that would have to be borne by the Santa Barbara region.

Again, according to Mr. Schuyler, the statistical probability of such an accident occurring in the channel are 0.47 per thousand, with 85.6 accidents occurring in the channel over the next 20 year period at the rate of 4.28 collisions per year.

Although at this date shipment of most of this region's oil seems to be assured by pipeline, and tanker traffic may very well never reach the levels envisioned by Mr. Schuyler, I think you will agree that this area will be facing absolutely unacceptable risks from tanker accidents and other forms of oil pollution.

GOO urges that more stringent oil spill and oil pollution liability laws be imposed - both by the state and the federal government. To date legislation has been approved by the state increasing liability limits. However, realistically the limits imposed are far from adequate. A tanker accident such as that described by Mr. Schuyler, or even a repetition of the Santa Barbara oil spill (which would have cost more than $500 million in 1984 dollars) simply would not be covered by any liability laws now in effect.

Another area of GOO concern is the capability of oil spill recovery and containment equipment. We believe it is long past time for government and industry to admit that present oil spill equipment is largely ineffective. Right now the maximum amount of an oil spill occurring in open water that has been

recovered is 25%. This is not enough. Containment of spills in a confined space such as a harbor is another matter and, if the water is completely calm recovery rate is good.

Although dramatic advances were made shortly after the 1969 spill, present cleanup techniques and equipment are still largely ineffective when waves are greater than six feet, winds are greater than 20 knots, and currents greater than 1 to 2 knots.

Conditions similar to the above exist in the channel a greater percentage of the time, particularly in the Point Conception area where much oil development is now under way.

We believe the California Coastal Commission has erred in not requiring the oil industry to meet more stringent clean-up and containment regulations. The commission has long admitted the inadequacy of existing equipment and its failure to meet fully requirements of the California Coastal Act.

Today GOO once again urges the state, and the federal government, to give the oil industry this message - improve oil spill cleanup and containment technology or quit offshore production. We are convinced the industry will meet whatever standards are imposed upon them.

To reduce the risk of a shipping catastrophe in the channel we urge the state and the federal government to fund a reevaluation of traffic regulations in the channel. Having worked on such regulations for many years, and without success, we well know how difficult it will be to effect any changes

since the channel is an international waterway.

Although the Coast Guard as recently as early 1984 conducted a study of channel traffic we believe that full consideration has not been given to the total traffic converging on the channel. The proliferation of oil industry traffic, including supply boats, crew boats and tankers,Alaskan tankers, freighters as well as pleasure craft, added to drilling rigs, platforms without doubt calls for imposition of further shipping regulations.

We believe regulations should prohibit any drilling vessel being located within 1,000 yards of the traffic lanes or buffer zones; that further consideration be given to making traffic lanes 'mandatory'; and that the traffic lanes should be further extended through the Santa Maria Basin instead of ending at Platform Harvest area.

Other points needing consideration are requiring all drilling rigs to have Automatic Radar Plotting Aid; that a Vessel Monitoring System for the channel be studied further; and that all oil support traffic (i.e. supply boats, crew boats) routes be defined. Additionally, we believe that the number of drilling rigs that can operate at anyone time in this area should be limited.

To summarize: it is impossible to produce 500,000 barrels of oil a day for a protracted period of time such as we are facing without experiencing at least some large

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and damaging oil spills, either from shipping incidents, from offshore production, or even from pipelines, tank farms and processing facilities.

Presently, we are not equipped to handle an oil spill of any size, in spite of the assistance provided by Clean Seas I and Clean Seas II.

The State Legislature is to be commended for the role it has taken in offshore oil and gas development. In particular, Senator Hart is thanked for the leading role he has taken in this matter.

But, as we have tried to point out, there remains much work to be done, may safeguards to be put in place, if we are to adequately meet the challenges facing us with this massive onslaught of oil. It is mportant that Santa Barbara is not destroyed and sacrificed in the process.

Thank you again for the privilege of presenting this statement before you.

Oil companies couldn't cope with San Francisco spill

By Marie De Santis

As oil platforms and tanker traffic increase, so do the chances of spills. Fishermen's groups, in their efforts to forestall the development of offshore oil, have repeatedly warned of the difficulty both of handling spills and of gauging the damage such spills cause to marine life.

Oil companies respond to these warnings with ardent assurances of their preparedness. They boast of the caliber of their company-sponsored co-ops — groups trained solely for the abatement of spills — and they point to volumes of contingency plans while holding forth about the extensive networks of military and civilian groups standing at the ready should an emergency arise.

The oil companies' claims were put to a boots-on test after an onboard explosion ripped through the tanker Puerto Rican just outside San Francisco's main shipping channel on Oct. 31, 1984. She was loaded to 25% capacity, carrying 91,000 bbls. of lube oil and 8,500 bbls. of bunker fuel. In the next three weeks, the event unfolded from the initial fire, to the break up of the vessel, to a major oil spill, to the recovery of the vessel forebody.

On May 28, 1985, Capt. K.F. Bishop, commanding officer of the Coast Guard's 12th District Marine Safety Office, signed the official "On Scene Coordinator's Report" of the incident. The following highlights of the report make it clear that not only was the best of manpower and equipment seriously inadequate for effective recovery and containment of this offshore spill, but that frequent bungling jeopardized the operation throughout.

Firefighting

None of the three oil company co-ops in California has any offshore firefighting capabilities. Of the four firefighting vessels initially called by the Coast Guard, three were out of commission within four hours. The San Francisco fireboat was not able to get out of port because of mechanical problems. Two hours later, the Oakland fireboat developed mechanical problems and was unable to continue fighting the fire. An hour and a half later, one of the Navy vessels that had been deployed was forced to depart due to "mast failure." Though winds and seas were calm, the fire was not extinguished until 32 hours after the explosion. The report states: "If the Puerto Rican explosion had occurred during heavy weather, offshore firefighting would have been beyond the capabilities of all the vessels that responded."

Jurisdiction

Because the explosion occurred outside the three-mile limit of territorial seas, the local captain of the port had no immediate authority over the stricken vessel, though he was the predesignated on-scene commander. From the time of the explosion until the Coast Guard's legal team could research a method to obtain authority, the positioning of the tanker was dependent on the owner's cooperation, even though the owner's potential interest in salvage was likely to conflict with the goal of pollution prevention. The only legal recourse was found to be the Intervention on the High Seas Act, which requires permission from the Coast Guard commandant on a case-by-case basis. The authority to prevent the Puerto Rican's owner from towing her closer to shore was not obtained until 40 hours after the explosion.

Positioning the Vessel

After the tugboat Sandy secured a line to the Puerto Rican, the best location for the vessel was determined to be 12 miles below the Farallon Islands and 20 miles west of Pt. Montara. This decision was based on the primary mission of pollution prevention, with particular concern for the highly productive Farallon Islands wildlife sanctuary. As such, the National Oceanic and Atmospheric Administration (NOAA) recommended that the vessel be towed as far out to sea as possible. However, this consideration had to be weighed against the limited reach of firefighting and salvage capabilities. Also considered were NOAA's predictions that any spilled oil would drift south.

In the dark early morning hours of Nov. 3, the Puerto Rican broke in two inside the Farallon sanctuary. The tug had towed the tanker too far north. One mile inside the sanctuary's southern border, the stern section sank with up to 8,500 bbls. of bunker fuel aboard.

For the past nine months it has continued to leak an estimated 20 bbls. a day into the heart of prime bottomfish and salmon grounds and will continue to do for another three months.

The Spill

In addition to the underwater leakage, at the time of the vessel's break-up, 25,000-30,000 bbls. of oil were released on the sea's surface. Regularly updated predictions from NOAA's scientific team continued to state that the oil would drift south. By the morning of Nov. 6, the main island of the Farallons was surrounded by oil. During the night, the spill had drifted — unnoticed — 25 miles north.

Tracking the Oil

Tracking the oil, according to the report, proved to be a major difficulty, especially at night and in the fog, when visibility for overflights was curtailed. For the entire duration of the Puerto Rican incident, not one of the multitude of experts involved thought to throw a drifting radio beacon into the oil slick, even though this technology has been available for decades and a half dozen of the devices can be purchased at any marine supply store for less than the cost of one overflight.

These beacons have been specially modified for use in oil spills, with skirts designed to fit the drift rate for various kinds of oil. Nonetheless, the on-scene report makes a strong recommendation that the Coast Guard, the Environmental Protection Agency, NOAA and private industry continue to work on developing oil-tracking systems.

Recovery of the Oil

The total oil lost into the environment was at least 46,000 bbls. (the bunker fuel is included here as oil). The major spill that occurred Nov. 3 was 25,000 to 35,000 bbls. Throughout the entire operation, only 730 bbls. of oil were recovered — less than 2% of the total loss of oil and less than 3% of the major surface spill.

The oil companies are responsible for maintaining vessels capable of cleanup and recovery. They have two vessels capable of doing this work offshore. One is the Doublebanger, which can only function in very light seas and in currents of less than 1½ knots. The other is the Mr. Clean II.

Built in 1978 and with a capability of long sea time, the 130' Mr. Clean II is the star of the oil companies' oil-spill fleet. In the on-scene report, the Mr. Clean II is described as a state-of-the-art vessel for handling offshore oil spills. Nonetheless, in the first eight days following the major spill, the Mr. Clean II was only able to clean up oil in the open sea for fewer than 15 hours.

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The Mr. Clean II did not work in the dark (except for one night when there was moonlight). The boat curtailed all work due to low visibility in fog, and for the entire eight days that the oil slick worked its way north, hitting the coast and harbors along the way, the Mr. Clean II was rendered useless on the open ocean as soon as seas hit 5' to 7'.

The Coast Guard report concludes, "Commonly encountered weather conditions greatly reduce the effectiveness of all available offshore cleanup equipment . . . Though an offshore containment and recovery capability is present, it is of limited effectiveness in a major offshore spill."

Furthermore, the Mr. Clean II spent the first three days after the spill laid up in Half Moon Bay for repairs. While the boat was responding to the call in 10' to 12' seas on the night of the break-up, a wave knocked out the windows of the pilothouse, which sits atop a 23'-high superstructure. The wave also knocked out the captain and most of his electronics.

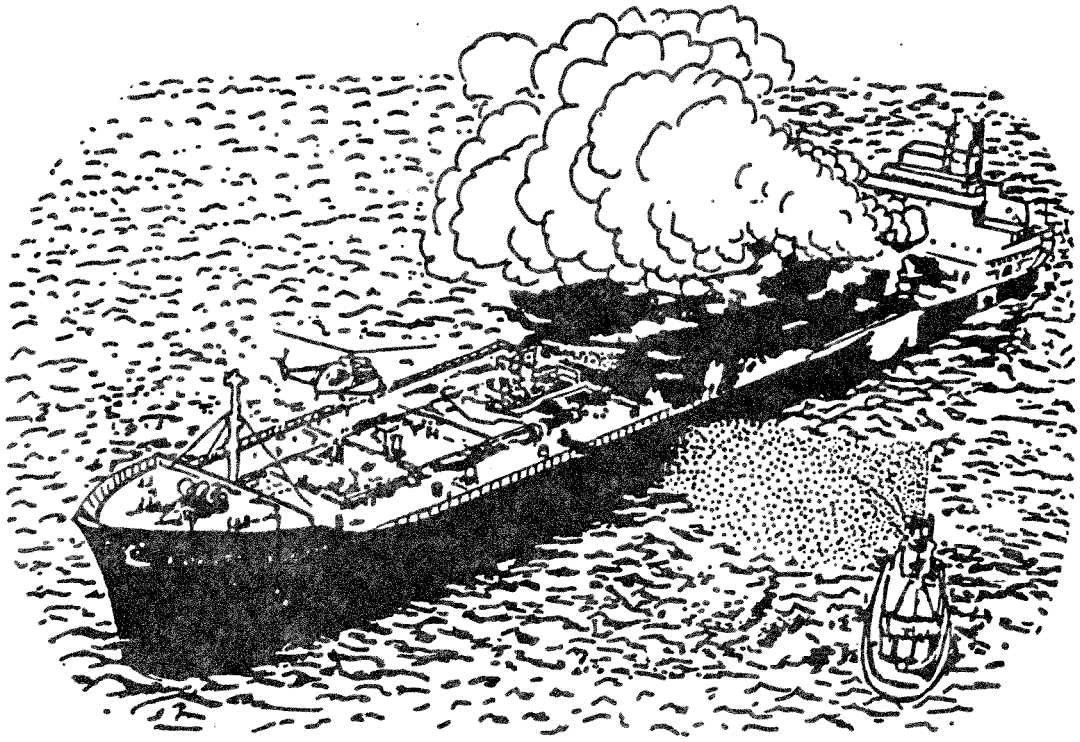
Clean Bay (the oil company co-op that runs the Mr. Clean II) claims in its summary of activities included in the Coast Guard report that the Mr. Clean II hit a freak wave two miles offshore. However, further investigation reveals that it is much more likely that a serious error in navigation was made while the boat was leaving the harbor.

A report filed by the Half Moon Bay harbor master's office describes an incident that occurred between the No. 1 and No. 3 buoys just outside the jetty. Bob McMann, the harbor master, oversaw the efforts to bring the crippled boat back to port that night. "In my opinion," he says, "they got themselves on the wrong side of the buoys, which put them right on the reef. This put them in the breakers, which have been on that reef forever and are quite a different thing from a freak wave.

"The reason we took so much trouble to determine their position was because the captain was unconscious and the first mate was incapacitated, and we [a harbor patrolman was also present] had to talk the engineer off the reef and back out to deep water . . . I really felt for the guys, because they came within yards of losing everything, but I also thought about that tanker out there spewing oil all over the ocean, and these were the guys who were supposed to be out there handling it." □

ANALYSIS OF THE *PUERTO RICAN* TANKER INCIDENT

RECOMMENDATIONS FOR FUTURE OIL SPILL RESPONSE CAPABILITY



OCTOBER 31, 1985

Michael J. Herz & Dianne Kopec

With the assistance of Richard T. Tinney, Jr.

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EXECUTIVE SUMMARY

One year ago the tanker PUERTO RICAN exploded and burst into flames just beyond the Golden Gate and then drifted to within a few miles of the coast. Moderate weather conditions permitted fire-boats usually restricted to the Bay to respond and to bring the fire under control, although two of them suffered mechanical difficulties and were forced to return to the bay.

Three days later, while undertow in the waters of the Point Reyes-Farallon Islands National Marine Sanctuary (contrary to Coast Guard orders), the PUERTO RICAN broke in two and the stern section sank, spilling 25,000-35,000 barrels (1,050,000-1,470,000 gallons) of oil into the ocean, creating a major pollution incident. Oil dispersant application was delayed because a sampling vessel was unavailable; the principal industry boat had been rendered inoperative by high seas.

Although the spilled oil moved south during the first three days after the breakup, as predicted by the NOAA spill trajectory expert, and did not touch land, suddenly, on the third night, the oil reversed direction and moved north, first encircling the Farallon Islands and then coming ashore in Bodega Bay and Bodega Harbor. Weather conditions and damaged equipment greatly reduced oil skimming effectiveness at sea, and lack of barges limited transfer of oil from skimmers. Approximately 1,500 barrels (63,000 gallons) of emulsified oil were skimmed from the ocean and from Bodega Bay during the entire incident, representing less than 2% of the total released when the ship broke up. Estimates

of the total bird mortalities resulting from the incident have been placed as high as 5,000.

Eighteen days after the explosion, the bow section of the PUERTO RICAN was towed back into San Francisco Bay without incident and the cargo safely unloaded. Although the stern section has been located in 1,246 feet of water through the use of side-scan sonar, no action has been taken to stop the leak which has continued since the sinking. It was estimated that the stern contained 8,500 barrels (367,000 gallons) of bunker fuel when it sank, but the results of our investigation strongly suggest that an additional 11,725 barrels (492,000 gallons) of oil cargo may also have gone down with the ship.

In this report we focus on specific responses to the PUERTO RICAN incident as a test of Northern California's spill response capability. We identify a number of problems encountered in dealing with the explosion, fire, spill and sinking of the vessel. We then carefully examine these difficulties to determine why they occur and make a series of recommendations designed to eliminate the problems, thus improving responses to future pollution incidents.

1. Offshore fire fighting capability does not exist in the Bay Area, and only the moderate weather conditions at the time of the explosion and fire made it possible to use fireboats that normally are restricted to the Bay. In more severe weather, the fire likely would have continued until the entire ship sank.

This problem can only be solved with a vessel with offshore capability based in the Bay Area and available for fire fighting (and perhaps towing, spill cleanup and oil storage) in waters off of Central and Northern California.

2. Emergency offshore towing in this region is provided only by vessels of opportunity. The PUERTO RICAN nearly drifted ashore before a tug that simply happened to be in the area was able to tow it offshore.

A multipurpose, dedicated vessel designed for offshore towing should be based in the Bay Area and available for emergency response.

3. There was no plan regarding a location to which the PUERTO RICAN could be towed to minimize danger to the environment.

A plan should be developed to identify offshore areas to which damaged or distressed vessels can be towed in order to reduce risks of environmental damage.

4. Predictions of the oil spill movement failed to anticipate a severe current reversal. Lack of previous oceanographic research on offshore currents and real-time information on spill location at night reduced predictive effectiveness.

A research program is needed to develop a better understanding of circulation patterns in the Gulf of the Farallones and the rest of central and northern California. Telemetry drifter buoys should be utilized to track spill movement under poor visibility conditions.

5. Offshore cleanup capability was seriously limited by weather and equipment availability. Much valuable time was lost in bringing in equipment from out of the region. Difficulties were encountered with chartered equipment refusing to respond in bad weather or being too far from the site of the spill.

The oil industry should be required to base its own offshore cleanup vessel and barges in the Bay Area for quick response and should develop plans for the staging of booms and other materials in areas of high risk (e.g., harbor and river mouths, biologically sensitive areas, etc.).

6. The decision to apply oil dispersants was made in the absence of complete information regarding potential damage to the environment from oil or toxicity of the dispersed oil.

The state should develop a program to determine the acute and chronic toxicity of dispersants and dispersed oil, create a library of information on dispersant effectiveness and toxicity, and develop guidelines regulating conditions for dispersant application and monitoring.

7. The sunken stern continues to leak bunker fuel oil into waters of the marine sanctuary and nearly half a million gallons of additional oil product may also be in the stern.

The Coast Guard and/or the ship owner should be required to perform a survey of the stern, attempt to stop the leak(s) and make recommendations regarding the remaining oil product on board.

8. Information on resources (organisms and habitats) at risk

in the area was incomplete, resulting in faulty decision making regarding protection strategies.

A detailed catalog and maps of resources, their seasonality and sensitivity to oil should be developed for Northern and Central California, and computerized for ease of periodic revision (with the assistance of local resource experts).

9. The direction of the movements of the PUERTO RICAN by the On-Scene Coordinator (OSC) required the presence of a representative of the OSC at all times during the incident. At one of the most critical periods of the incident, the OSC representative was forced by weather conditions to leave the scene and this is when the tug violated the Coast Guard boundaries and the PUERTO RICAN sank.

In order to maintain total control of a pollution incident and vessels involved in it, the On-Scene Coordinator must have a representative present at all times. It should be possible to develop a system for delegation of several representatives, or to have a designated representative appoint a replacement if he must leave the scene.

10. The tug towing the PUERTO RICAN crossed boundaries establishing prohibited areas and spent almost half a day in violation of Coast Guard orders, north and east of bounded areas. There appear to have been no written copies of the orders establishing these boundaries.

Procedures should be established to require that explicit orders relating to Coast Guard intervention authority be in writing and that copies of such orders be delivered to vessel owners or their representatives and other interested parties.

The PUERTO RICAN explosion, fire, breakup and sinking were all components of a serious pollution incident. However, the small number of birds and mammals present in the Gulf of the Farallones during this time of year minimized the environmental damage. Had this incident occurred several months earlier, the potential damage to sea birds might well have been severe, with perhaps an order of magnitude more birds on S.E. Farallon Island; and if it had been a few months later, tens of thousands of whales, elephant seals and Steller sea lions would have been in the area. This, combined with the relatively light oil pro-

duct spilled that did not persist on beaches and rocky, intertidal areas, contributed greatly to a much milder incident than might have occurred with a more typical crude oil product.

Despite the fact that the PUERTO RICAN incident was not a "worst case" accident, the resulting damage and insurance claims may well exceed $150 million.

The Coast Guard has already begun to revise its Oil Spill Contingency Plan, consistent with some of the recommendations made in this report, and legislation has recently been enacted in the state which will improve resource mapping and dispersant effectiveness research. We hope that the recommendations presented here will be used to further improve future responses to oil spills off the Central and Northern California coast.

SENATE SUBCOMMITTEE ON OFFSHORE OIL AND GAS DEVELOPMENT - NOV. 4, 1985 HEARING

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HEARING TESTIMONY - CLEAN SEAS

MY NAME IS C. W. WAAGE

I HAVE COME TO TALK FACTUALLY ABOUT THE CAPABILITY ON THE CENTRAL COAST FOR THE CONTAINMENT AND CLEANUP OF MARINE OIL SPILLS

I HAVE SOME FAMILIARITY WITH THAT SUBJECT BECAUSE I AM MANAGER OF CLEAN SEAS, AN ORGANIZATION CREATED 15 YEARS AGO BY THE OIL INDUSTRY TO PROVIDE JUST SUCH A CAPABILITY.

JUST A FEW WORDS OF BACKGROUND.

CLEAN SEAS CAME INTO BEING SHORTLY AFTER THE 1969 OIL SPILL IN THE SANTA BARBARA CHANNEL -- WHICH HAD MADE IT ALL TOO APPARENT THAT -- AT THAT TIME -- THERE WAS REALLY NO EFFECTIVE WAY TO DEAL WITH LARGE OIL SPILLS IN THE OPEN OCEAN.

THE OIL INDUSTRY -- PARTICULARLY THOSE COMPANIES OPERATING IN THE CHANNEL -- IMMEDIATELY REALIZED THAT THERE NEEDED TO BE THE CAPABILITY TO DEAL WITH POTENTIAL OFFSHORE OIL SPILL EMERGENCIES.

THE LIKELIHOOD OF SIGNIFICANT OIL SPILL EMERGENCY, TO DAY IS EXTREMELY REMOTE -- EVEN MORE SO IN VIEW OF INCREASINGLY MORE STRINGENT OPERATING RULES AND CONTINUED DEVELOPMENT OF IMPROVED TECHNIQUES AND TECHNOLOGY.

OBVIOUSLY NO OUTSIDE CONTRACTOR COULD AFFORD TO INVEST THE MILLIONS AND MILLIONS OF DOLLARS REQUIRED TO DEVELOP AND MAINTAIN A CLEANUP CAPABILITY THAT WOULD SELDOM, AND POSSIBLY NEVER, BE USED. FOR SUCH A CAPABILITY TO BE AVAILABLE, THE OIL INDUSTRY WOULD HAVE TO PROVIDE IT. THUS CLEAN SEAS CAME INTO BEING. WE PRESENTLY HAVE 16 MEMBER OIL COMPANIES WHO CONTRIBUTE 4-5 MILLION DOLLARS PER YEAR. IN A MOMENT WE WILL LOOK AT WHAT CLEAN SEAS HAS BECOME -- 15 YEARS LATER.

BUT, FIRST, ANOTHER BIT OF BACKGROUND:

THE OIL INDUSTRY WAS CORRECT. OIL SPILL CONTAINMENT AND CLEANUP QUICKLY BECAME AN IMPORTANT ELEMENT IN THE FEDERAL APPROVAL PROCESS.

THE DEPARTMENT OF THE INTERIOR (WHICH EXERCISES JURISDICTION AND CONTROL OVER DEVELOPMENT IN FEDERAL WATERS THROUGH THE MINERALS MANAGEMENT SERVICE) AND THE UNITED STATES COAST GUARD (WHICH HAS ULTIMATE RESPONSIBILITY TO SEE THAT OFFSHORE OIL SPILLS ARE CLEANED UP) DEVELOPED A MEMORANDUM OF UNDERSTANDING CONCERNING THE REGULATION OF ACTIVITIES AND FACILITIES ON THE U.S. OUTER CONTINENTAL SHELF.

AMONG OTHER THINGS, THE MOU GIVES THE COAST GUARD THE RESPONSIBILITY TO REVIEW OIL SPILL CONTINGENCY PLANS SUBMITTED TO MMS BY PROSPECTIVE OFFSHORE OIL OPERATORS. THE CRITERIA TO JUDGE THE ADEQUACY OF THE OIL SPILL RESPONSE ORGANIZATION, CLEANUP EQUIPMENT AND PROCEDURES

ARE JOINTLY SET BY MMS AND THE COAST GUARD.

ESSENTIALLY, THESE CRITERIA REQUIRE THAT CONTAINMENT AND CLEANUP EQUIPMENT BE STATE-OF-THE-ART -- NOT JUST ADEQUATE BUT THE BEST, THE VERY BEST THERE IS!

THE MOU ALSO ESTABLISHED A TECHNICAL REVIEW BOARD, COMPOSED OF MMS AND COAST GUARD EXPERTS, TO ASSIST THE COAST GUARD IN ASSESSING THE CONTINGENCY PLANS SUBMITTED. SPECIFICALLY THESE EXPERTS:

1. ADVISE WHETHER RESPONSE EQUIPMENT ACTUALLY MEETS CURRENTLY ACCEPTED STATE-OF-THE-ART CRITERIA;
2. ADVISE WHETHER THE AMOUNTS AND TYPES OF EQUIPMENT ARE ADEQUATE;
3. ADVISE CONCERNING ACCEPTABLE RESPONSE TIME UNDER LOCAL CONDITIONS;
4. KEEP ABREAST OF NEW DEVELOPMENTS IN RESPONSE EQUIPMENT SO AS TO REVISE STATE-OF-THE-ART CRITERIA ACCORDINGLY; AND,
5. PROVIDE TECHNICAL INFORMATION ON THE EQUIPMENT PROPOSED BY THE APPLICANT.

IN SHORT, THE POINT I WANT TO EMPHASIZE HERE IS THIS:

THE CAPABILITY TO CONTAIN AND CLEANUP OIL SPILLS MAINTAINED BY ORGANIZATIONS LIKE CLEAN SEAS IS JUDGED AND KEPT UNDER ROUTINE SURVEILLANCE BY PROFESSIONALS -- PROFESSIONALS TRAINED AND EXPERIENCED IN THIS SPECIFIC AREA OF EXPERTISE. THEY HAVE ONLY ONE STANDARD OF ACCEPTANCE -- THE BEST!

WITH THAT AS A BACKGROUND, LET'S LOOK AT THE OIL SPILL CONTAINMENT AND CLEANUP SITUATION TODAY ON THE CENTRAL COAST.

CLEAN SEAS' AREA OF RESPONSIBILITY REACHES FROM POINT MUGU ON THE SOUTH, AND NORTH JUST ABOVE MORRO BAY.

BY MMS AND COAST GUARD REGULATION, OIL SPILL PROTECTION STARTS AT THE POTENTIAL SOURCE. EACH PLATFORM, DRILL SHIP AND TANKER TERMINAL IN THE AREA HAS IMMEDIATE RESPONSE EQUIPMENT AND MEN TRAINED TO DEPLOY IT QUICKLY. THE SMALL SPILLS THEY ARE DESIGNED TO HANDLE, A FEW GALLONS OR A FEW BARRELS ARE RARE. BUT THE OPERATORS AND THE EQUIPMENT ARE READY.

IF THE INCIDENT IS NOT QUICKLY HANDLED ON THE SPOT, CLEAN SEAS WOULD BE CALLED.

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WE DO NOT HAVE THE TIME TO LIST AND DESCRIBE ALL THE EQUIPMENT CLEAN SEAS HAS ON HAND FOR RESPONSE TO SPILLS, BUT SOME EXAMPLES WOULD BE INFORMATIVE. HERE ARE A FEW SLIDES TO SHOW THIS.

THE MAINSTAYS OF CLEAN SEAS' OFFSHORE CAPABILITY ARE TWO SPECIALLY DESIGNED OIL SPILL RECOVERY VESSELS -- MR CLEAN-I and MR CLEAN-II (CLEAN SEAS IS ADDING MR CLEAN-III, 180' VESSEL COMPLETELY EQUIPPED AS MR CLEAN-I AND MR CLEAN-II ARE, ALONG WITH A 45' FAST RESPONSE BOOM BOAT TO REINFORCE OUR CAPABILITY TO RESPOND TO AN INCIDENT IN THE SANTA MARIA BASIN. THIS VESSEL WILL BE KEPT IN THE VACINITY OF PT. ARGUELLO.) MR CLEAN-I IS MOORED IN SANTA BARBARA.

A SPEED OF 12 KNOTS, PLUS LARGE FUEL AND WATER CAPACITY, ENABLE THE SHIP TO REACH A SPILL SITE QUICKLY AND REMAIN AT SEA FOR EXTENDED PERIODS OF TIME. IT CARRIES ADVANCING SKIMMERS ON EITHER SIDE AND IS CAPABLE OF CLEANING A 124-FOOT SWATH THROUGH AN OIL SLICK ON EACH PASS. GUIDELINES INCLUDED IN THE MEMORANDUM OF UNDERSTANDING SPECIFY THAT RECOVERY EQUIPMENT SHOULD BE CAPABLE OF OPERATING IN EIGHT- TO TEN-FOOT SEAS AND WINDS OF 20 KNOTS, WITH DEPLOYMENT ACCOMPLISHED IN THE FIVE- TO SIX-FOOT RANGE. THE COAST GUARD RECOGNIZES MR CLEAN-I AS STATE OF THE ART.

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MR CLEAN-II, MOORED AT SAN LUIS BAY, IS SIMILAR TO MR CLEAN-I. DURING THE TIMEFRAME BETWEEN THE CONSTRUCTION OF THE TWO SHIPS, AN ADVANCED SKIMMER, THE OFFSHORE DEVICE, WAS DEVELOPED AND TESTED. UNDER MANY CONDITIONS, IT PROVED TO BE SUPERIOR TO EXISTING EQUIPMENT AND WAS, THEREFORE, SELECTED FOR THE NEW VESSEL. SEVERAL YEARS OF AT-SEA EXPERIENCE AND TESTING CONFIRMED ITS VALUE . THEREFORE, IN KEEPING WITH ITS RESPONSIBILITY, CLEAN SEAS REPLACED THE ORIGINAL SKIMMERS ON MR CLEAN-I WITH OFFSHORE DEVICES.

RAPID DEPLOYMENT OF CONTAINMENT BOOMS AT THE SPILL SITE IS, OF COURSE, THE EFFECTIVE WAY TO MINIMIZE POTENTIAL DAMAGE. TO ACCOMPLISH THIS, CLEAN SEAS HAS TWO SPECIALLY DESIGNED RAPID RESPONSE CRAFT WHICH CAN DELIVER BOOM TO THE SPILL AREA AT A HIGH SPEED. THIS RESPONSE TIME IS, IN MOST CASES, MANY TIMES FASTER THAN SPECIFIED IN COAST GUARD GUIDELINES.

IN ADDITION TO THE SKIMMERS MOUNTED ON MR CLEAN-I AND MR CLEAN-II, CLEAN SEAS LISTS AN INVENTORY of 18 SKIMMERS OF VARIOUS CAPABILITIES AND DESIGNED FOR USE UNDER A VARIETY OF CIRCUMSTANCES. THESE INCLUDE SELF-PROPELLED WEIR-TYPE UNITS INTENDED FOR HARBORS AND PROTECTED WATERS;HYDRAULIC AND AIR-DRIVEN SKIMMERS, PRINCIPALLY USED TO RECOVER OIL HELD BEHIND CONTAINMENT BOOMS; AND A CATAMARAN

SKIMMING BARGE, TOWED WITH OIL CONVERGING BOOMS, THAT CAN CLEAR A 200-FOOT SWATCH THROUGH FLOATING OIL UNDER MODERATE SEA CONDITIONS.

CLEAN SEAS' INVENTORY OF CONTAINMENT EQUIPMENT TOTALS MORE THAN 45,000 FEET OF VARIOUS SIZED BOOMS DESIGNED FOR SPECIFIC FUNCTIONS. THEY RANGE FROM MORE THAN 2½ MILES OF LIGHT DUTY BOOMS FOR HARBOR PROTECTION; OVER THREE MILES OF MEDIUM-HEAVY DUTY BOOM FOR RAPID DEPLOYMENT OFFSHORE AND 2½ MILES OF HEAVY-DUTY BOOM FOR CONTAINMENT IN MORE SEVERE SEA-STATES.

BOOMS ARE ALSO DEPLOYED AS DIVERSION BARRIERS FOR THE PROTECTION OF SENSITIVE AREAS -- WETLANDS, SLOUGHS, RIVER MOUTHS AND HARBORS. THESE SENSITIVE AREAS HAVE BEEN IDENTIFIED BY MARINE BIOLOGISTS AND DETAILED PLANS HAVE BEEN INDIVIDUALLY DEVELOPED FOR THE PROTECTION OF EACH AREA.

COAST GUARD GUIDELINES SPECIFY THAT EXERCISES FOR DEPLOYING EQUIPMENT IN OPEN WATER SHOULD OCCUR AT LEAST ANNUALLY -- AND THAT THERE BE AT LEAST ONE HANDS-ON DRILL EACH YEAR AS PART OF THE TRAINING PROGRAM. INSTEAD OF ANNUALLY, CLEAN SEAS CONDUCTS SUCH DRILLS AND EXERCISES AT LEAST TWICE MONTHLY. THESE DRILLS ALSO TRAIN MEMBER COMPANY PERSONNEL. THESE SESSIONS ARE FREQUENTLY OBSERVED AND MONITORED BY FEDERAL, STATE AND LOCAL REGULATORY PERSONNEL, INCLUDING THE COAST GUARD. ANY MEMBER OF YOUR STAFF IS INVITED TO ATTEND THESE EXERCISES.

F7

IN ADDITION TO TRAINING, THESE DRILLS AND EXERCISES ARE USEFUL IN DEVELOPING MORE EFFECTIVE TECHNIQUES AND TO TEST THE EFFECTIVENESS OF NEW OR EXPERIMENTAL EQUIPMENT.

THE COAST GUARD IS RESPONSIBLE FOR EVALUATING THE OIL INDUSTRY'S ABILITY TO CONTAIN AND CLEANUP OIL SPILLS IN THIS AREA. THEY EXAMINE THE TOTAL SYSTEM TO MAKE SURE THAT THERE IS SUFFICIENT MIX IN EQUIPMENT TO MEET THE VARIETY OF POTENTIAL EMERGENCIES -- AND THAT EACH SIGNIFICANT COMPONENT IN THE MIX IS THE BEST AVAILABLE.

EVALUATION IS A CONTINUOUS PROCESS. IT IS THEIR OFFICIAL DUTY AND PROFESSIONAL RESPONSIBILITY TO BE AWARE OF ADVANCES IN TECHNIQUE AND TECHNOLOGY -- AND THEN BE SURE THESE ADVANCES ARE INCORPORATED INTO THE OIL INDUSTRY'S CONTAINMENT AND CLEANUP CAPABILITY. IN OFFICIAL REPORTS AND IN PUBLIC TESTIMONY, THE COAST GUARD GIVES CLEAN SEAS HIGHEST MARKS FOR ITS PROVEN ABILITY TO RESPOND IMMEDIATELY WITH OCEAN EFFECTIVE EQUIPMENT.

THE COAST GUARDS POSITIVE EVALUATION OF CLEAN SEAS' CAPABILITY IS REINFORCED BY CONTINUOUS STUDIES CONDUCTED BY THE HIGHLY REGARDED CONSULTING FIRM OF WOODWARD-CLYDE. THEIR STAFF ARE SOME OF THE MOST EXPERIENCED AND INFORMED OIL SPILL CLEANUP EXPERTS IN THE WORLD.

F8

THEY FIRSTHAND, OBSERVED AND CRITIQUED CLEANUP OPERATIONS AT VIRTUALLY EVERY OIL SPILL OF ANY SIGNIFICANCE, WORLDWIDE, FOR MORE THAN A DECADE. THEY KNOW WHAT WORKS AND UNDER WHAT CONDITIONS. AND THEY FORTHRIGHTLY DESCRIBED CLEAN SEAS AS HAVING MORE OIL SPILL CONTAINMENT AND CLEANUP CAPABILITY THAN ANY SIMILAR ORGANIZATION -- ANYWHERE. THERE IS NO QUESTION, IN THEIR JUDGEMENT, OF CLEAN SEAS' ABILITY TO DEAL WITH OFFSHORE OIL SPILL EMERGENCIES.

SO . . . . . THAT IS WHAT CLEAN SEAS IS TODAY -- AN EFFECTIVE, TRAINED AND EXPERIENCED ORGANIZATION CAPABLE OF DEALING WITH POTENTIAL OIL SPILL EMERGENCIES, PROMPTLY AND EFFECTIVELY. IT IS OUR FURTHER RESPONSIBILITY TO MAINTAIN THIS STATUS IN THE FUTURE.

I'LL CLOSE WITH A FEW OBSERVATIONS ABOUT FUTURE DEVELOPMENTS IN OIL SPILL CLEANUP. MOST OF US IN THIS FIELD FEEL THAT WE HAVE, PERHAPS, VIRTUALLY REACHED THE UPWARD LIMITS OF OUR ABILITY TO CLEANUP OIL MECHANICALLY. MOST OF THE RESEARCH AND EXPERIMENTS NOW BEING CONDUCTED BY THE INDUSTRY, GOVERNMENT AGENCIES, AND BY OUTSIDE MANUFACTURERS ARE IN THE AREA OF DRAMATICALLY IMPROVING OUR CAPABILITY TO DEAL WITH OIL SPILLS CHEMICALLY AND BIOLOGICALLY -- WITH NON-TOXIC DISPERSANTS AND ORGANISMS THAT WILL RENDER HYDROCARBONS HARMLESS TO THE MARINE ENVIRONMENT.

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AT THE PRESENT TIME, OF COURSE, CLEAN SEAS IS ABLE TO APPLY DISPERSANTS TO OIL SLICKS BY SURFACE VESSELS, HELICOPTERS, STATIONED HERE -- OR BY A DC-4 THAT CAN BE ONSITE IN A FEW HOURS. THIS TYPE OF CHEMICAL APPLICATION IS AUTHORIZED BY REGULATORY AGENCIES NOW, ONLY WHEN OTHER RECOVERY METHODS ARE NOT SUFFICIENTLY EFFECTIVE. BUT AS RESEARCH CONTINUES AND POTENTIAL TOXICITY PROBLEMS ARE ELIMINATED, I PREDICT THAT MOST FUTURE ADVANCES WILL BE MADE IN THIS VERY PROMISING FIELD.

BUT WHATEVER THE FUTURE HOLDS, THE OIL INDUSTRY AND CLEAN SEAS WILL CONTINUE TO PROVIDE THE MOST EFFECTIVE PROTECTION AGAINST OIL SPILL DAMAGE THAT SCIENCE AND PERSONAL DEDICATION CAN PROVIDE.

THANK YOU.

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Statement Prepared By

Computer Aided Operations Research Facility (CAORF)
U.S. Maritime Administration
Department of Transportation

Presented At

"The Role of the State in Reducing the Major Risks of Offshore Oil and Gas Operations: The Santa Barbara Channel and the Santa Maria Basin as a Case Study"

A hearing under the joint auspices of the California State Senate Subcommittee on Oil and Gas Development and the University of California at Santa Barbara

Date

November 4, 1985

Location

University of California at Santa Barbara
University Center

Introduction and Background

CAORF is pleased to provide expert opinion and make recommendations concerning the issue of reducing the major risks of offshore oil and gas recovery operations. CAORF's area of expertise is in the application of research design and analysis methods using shiphandling simulation.

The Computer Aided Operations Research Facility (CAORF) is a U.S. government owned research facility under the direct management of the Maritime Administration, Department of Transportation. CAORF is located on the grounds of the U.S. Merchant Marine Academy at Kings Point, New York, and has been in operation since 1976. Most of CAORF research projects are performed on a cost reimbursable basis.

CAORF's primary research tool is high fidelity, real-time, man-in-the-loop, shiphandling simulation. Virtually any vessel, any geographical area and all the important variables that impact shiphandling, collision avoidance and navigation can be simulated to a very high degree of accuracy and realism.

CAORF's research method can be summarized as follows: We model problems relating to the movement of ships and then permit practicing ship's Captains, Pilots, or Mates (the men-in-the-loop) to sail the simulated ship under a series of carefully designed, realistic operational conditions. Data are recorded and analyzed, and results reported.

CAORF is the most sophisticated shiphandling research facility in the world, not only in raw simulation capability -- but also in skill and experience in the application of this relatively new technology to real world operational problems and needs.

Of particular interest on this occasion is that in the period 1979 through 1980, the California Coastal Commission was a CAORF research sponsor. The Santa Barbara Risk Management Program was undertaken under the joint sponsorship of the California Costal Commission and the Maritime Administration's Office of Research and Development. The program yielded, among other results, recommendations for the placement of temporary and permanent oil rigs and platforms relative to the ship traffic lanes in the Santa Barbara Channel.

What are the major risks associated with the rapid increase of oil and gas recovery activities off the California coast? What steps can be taken to reduce them?

From the perspective of CAORF's ability to assist, the risks are associated with the increase in vessel traffic and the proximity of navigating vessels to areas where offshore oil recovery activities are in progress. The dangers include increased risk of collisions, ---with ships colliding with other ships, ----and with ships colliding with fixed offshore structures; and in some areas, an increase in the risk of vessel groundings.

CAORF is participating in this hearing because we believe that shiphandling simulation provides the best and most reliable method to assess these risks, and to assess the available risk reduction alternatives that will come under consideraton.

The advantage of man-in-the-loop simulation in risk assessment and in the evaluation of the effectivness of alternative approaches to the reduction of risk is that this type of simulation considers all of the elements comprising the marine transportation system. The system in which vessels are navigated includes the characteristics of the environment, the channel or waterway geometry, aids to navigation, the vessel, the operator, and many other elements such as traffic conditions and schedule demands. Within this system, and in so far as vessel navigation is concerned, the human operator is the executive or primary controller.

Consequently, when simulation is used to assess the factors which contribute to or constrain safety, the man-machine systems perspective plays a major role in shaping how the problem is viewed. For example, contributing to safety are any modifications to the system which result in more reliable and predictably accurate vessel positioning (e.g., the use of precision electronic aids to navigation), or allows information to be more easily assimilated and accurate decisions more easily made (e.g., the marking of fixed offshore structures with RACONS).

Modifications that either constrain or contribute to safety can be made to any component of the system: the environment (such as the placement of fixed structures in a traffic seperation zone); the information system available to the mariner (such as the provision of a VTS), or to the mariner himself (such as training programs).

The problem that the decision makers must ultimately grapple with is how to evaluate such changes to the system for their impacts on safety. The evaluation of the alternative mitigation plans is often made using expert opinions about the relative effectivness of the modifications. If the design changes are major,--or novel, even the experts may not be able to accurately assess their impacts. To accurately asses the effects of proposed changes on safety, all components to the marine system must be included in the analysis. The operator, the vessel and the environment. Since safety of the system is a function of the interaction of all of these elements, and the operator is the executive of the entire system, ommision of any one element, especially the operator, can lead to incorrect evaluations.

Ideally, such evaluations should be done on a trial basis in the real world. Since the real world is rarely a feasible environment to conduct safety assessments, full-mission, man-in-the-loop simulators become the most promising alternative.

Using simulation, levels of risk can be derived and quantified. A general experimental approach would be as follows: The risk mitigating system design alternatives, whether they be the establishment of a VTS, modifications to aids to navigation, or operator training, are modeled on the simulator along with the system conditions that embody the risk, for example increased vessel traffic or fixed structures in a fairway. The mariners that will actually pilot the vessels, Masters, Pilots or mates then bring the simulated vessel through all conditions. That is the existing and modified conditions in conjunction with important related variables such as environmental conditions. Data pertaining to safety is collected. Safety can be quantifiesd along the principle dimension of interest (vessel proximity to other vessels or fixed structures, track

keeping accuracy, operator work load). With a powerful experimental design extraneous factors can be controlled and the risk mitigation alternatives can be statistically compared and the relative safety of each shown.

In addition to providing a foundation for a scientific risk assesment, simulation has the added benefit of allowing experts to observe the proposed system design modifications in operation. This places the expert in a much more informed position to base judgements as to the impacts of proposed modifications on safety. Indeed, a structure for collecting the subjective observations of the participating operational personnel is built into every experiment.

When utilized in this way, simulation becomes a unique and valuable aid in the risk management process by performing the difficult risk assessment function. Those charged with the task of deciding between the alternative courses of action to control risk, can be informed of the relative effectivness of available alternatives through simulation. So informed they can proceed to the evaluation of the various alternatives based on other factors such as ease of implementation, user acceptance and overall cost effectivness.

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"CAORF IN 60 SECONDS"

The Computer Aided Operations Research Facility (CAORF) contains the most sophisticated bridge simulator in the world today. Using the simulator, we are able to safely and economically model the marine world, expose ship officers to marine problems, and record performance as they act out their solutions to these problems.

The heart of the facility is the simulated bridge containing real bridge equipment (such as radars, steering stand, communications equipment). The bridge is surrounded by a massive circular screen on which is projected a computer-generated image of the area in which the ship is sailing. A wide variety of ship models ranging from tankers to nuclear submarines can be used in simulation.

The idea behind CAORF is simple. We model problems involving shiphandling and then permit actual captains/pilots to sail the CAORF ship under realistic environmental conditions to observe the effects on human performance. Data are recorded and analyzed to permit objective decisions to be made concerning the adequacy of designs or the feasibility of different operating conditions. Proposed dredging designs can be optimized (as in Norfolk), equipment requirements evaluated (as with Collision Avoidance Systems), shiphandling experience provided (as with U.S. Navy TRIDENT submarines) and training methodologies studied (as with maritime cadets and tugboat operators). All of this can be accomplished from the safety of the simulator before designs are implemented in the real world.

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Statement before the Senate Subcommittee
on Oil and Gas Development Hearing held on November, 1985
at the University of California, Santa Barbara

It seems inevitable that the subject of risk is raised in connection with the growing development of oil resources offshore the Santa Barbara region. It is after all in the interest of each party that risks be minimized. For their part, the oil industry can certainly be counted on to exert their very considerable engineering skills toward that end; the minimization of risk is a major responsibility of their engineering staffs and they possess considerable know-how in this business by now. The State of California and local communities have no less interest in risk avoidance, as the fact of this Hearing attests. And, of course, Federal government agencies have specific responsibilities for offshore risk avoidance.

My own experience in the consideration and study of complex engineering questions is that lengthy and involved deliberations ensue, often lasting years. These are often limited in their conclusions by the imperfect state of existing knowledge, by the particular knowledge and capability of these experts who can be assembled at the time, and the results are often unsatisfactory, unclear, and the subject of contention. I think this could often be the case here, where you are ultimately concerned with questions such as ship collision probability, the consequences of collision or other causes of structural failure, or of fire, of other environmental hazards, etc. You are here, fortunately enough, discussing risk before the event, but tragically enough, these studies are often carried out in the aftermath of accident, usually unforeseen, and the resolution is further hampered by an atmosphere of suspicion and blame, by considerations of legal and financial responsibility, and by urgent clamors for remedial action and legislation.

Given these facts, it seems to me that it is very much in the interest of each party - industry and government, to seek far-sighted mechanisms for dealing with discussions of engineering risk avoidance and, particularly, the consequences of accident. With regard to the engineering and scientific aspects, two conditions would very much improve the present situation:

1.) that the State of California bring into being a small but adequate, and focussed expertise (Center of Expertise) on the engineering questions involved, and

2.) that continuous technical contact and even cooperation ensue between State, Industry, and Federal government engineers and scientists.

I have earlier proposed that such a South-Central Coast Center of Expertise be established at UCSB, based on existing and growing faculty capability, to emphasize:

- ship and platform safety and reliability
- environmental effects in the coastal zone

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This Center would serve the State of California, the local Offshore [illegible]stry, and Federal Agencies. Its purposes would be to carry out scientific [illegible]udies, collect and evaluate technological information, and conduct e[illegible]ational programs related to its major subject, including:

- environmental loads and structural integrity
- maneuverability and collision avoidance
- capsizing and mooring
- wave and current effects on the shore and shore facilities
- waste disposal and pollution in the coastal zones

including the effect of oil and gas spills and technology for abatement.

Such a Center would be unique in California, and perhaps in the U.S. It has an antecedent in the large Norwegian Offshore Technology Research Program funded by all participants in the Norwegian sector North Sea exploitation.

Each of the State of California, the Federal Government, and the Offshore Oil Industry should be interested in such a Center of Expertise. The State (and local governments) because they will badly need the expertise in the long run as an aid to governance and legislation and in coping with emergencies (think of the long and expensive fire in the Mexican sector of the Gulf); the Federal Government because they have responsibility for inspection and licensing of offshore structures and operations (the Coast Guard and the Geological Survey); the Offshore Oil Industry because of their interest in persuing long-term exploitation in the South-Central Coast in harmony with public, state, local, and federal agencies and interests.

Whatever the form such far-sighted measures as proposed above might eventually take, I urge the State as well as the other interested parties to begin implementing them now, so they can serve their purpose when the need arises.

Marshall P. Tulin
Presidential Professor, UCSB

Professor Marshall Tulin has held the Presidential Chair at UCSB since 1982, the University's first endowed chair. He has been a member of the National Academy of Engineering since 1979 and was the Founder and Board Chairman of Hydronautics, Incorporated, a prominent and pioneering engineering firm in the field of Ocean Engineering. He is a former member of the Marine Board of the National Research Council, has served the Federal Government in various scientific capacities, and is currently a member of the California Sea Grant Committee.

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TESTIMONY TO SENATE SUBCOMMITTEE ON OIL AND GAS DEVELOPMENT

4 NOVEMBER 1985

APPLICATION OF RISK ANALYSIS TO OFFSHORE OIL AND GAS OPERATIONS

BY

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I WOULD LIKE TO MAKE SOME COMMENTS CONCERNING THE USE OF RISK ANALYSIS IN OFFSHORE SAFETY AND ENVIRONMENTAL MANAGEMENT BOTH IN THE U.S. AND ABROAD. THESE COMMENTS COME FROM A RESEARCH PROJECT CONDUCTED AT M.I.T. ABOUT FOUR YEARS AGO SUPPORTED BY THE MINERALS MANAGEMENT SERVICE THROUGH A CONTRACT FROM SANDIA NATIONAL LABORATORIES. THE FINDINGS AND OPINIONS ARE SOLELY MINE AND THOSE OF MY CO-WORKERS: CHRIS HILL, GEORGE HEATON AND DAVID CHENEY.

OUR STUDIES OF THE POTENTIAL AND THE LIMITATIONS OF USING RISK ANLAYSIS IN OFFSHORE SAFETY AND ENVIRONMENTAL MANAGEMENT SUGGEST CERTAIN POLICY OPTIONS FOR CONSIDERATION BY GOVERNMENTAL AGENCIES, PRIVATE OPERATORS AND OTHER PARTIES INTERESTED IN OFFSHORE ACTIVITIES.

RISK ANALYSIS CAN BE USED BY REGULATORY AGENCIES TO HELP SET PRIORITIES FOR ENFORCEMENT OF EXISTING SAFETY AND ENVIRONMENTAL REQUIREMENTS AND FOR ESTABLISHING NEW REGULATIONS TO ADDRESS NEWLY DISCOVERED OR POTENTIAL PROBLEMS. FOR EXAMPLE, THE OVERALL PLANS FOR DEVELOPMENT OFF THE CALIFORNIA COAST MIGHT BE IMPROVED BY STUDIES OF

THE POTENTIAL CONFLICTS BETWEEN OFFSHORE ACTIVITIES AND SHIPPING LANES IN THE REGION.

THESE METHODS CAN ALSO BE USED FOR REEXAMINING EXISTING REQUIREMENTS TO DETERMINE WHETHER THEY ARE ACHIEVING THEIR GOALS AND THERE HAVE BEEN INSTANCES WHERE A RISK ANALYSIS HAS LED TO THE ELIMINATION OF AN EXISTING REGULATION. FOR EXAMPLE, A NORWEGIAN STUDY SHOWED THAT OVERALL RISK WAS LOWERED BY NOT REQUIRING STAND-BY SHIPS FOR NORTH SEA PLATFORMS. PREVIOUSLY, STAND-BY SHIPS HAD BEEN MANDATED.

PRIVATE OPERATORS, SUCH AS OIL COMPANIES, DRILLING CONTRACTORS, EQUIPMENT DESIGNERS AND SYSTEM FABRICATORS MAY WISH TO CONSIDER EXPANDING THEIR USE OF PROBABALISTIC METHODS IN THEIR STUDIES OF THE HAZARDS OF NEW SYSTEMS THEY PROPOSE TO USE. THIS PRACTICE COULD HELP MAKE THEIR DESIGNS AND OPERATIONS SAFER AND LESS COSTLY IN THE LONG RUN, FOR THEMSELVES, FOR WORKERS AND THE ENVIRONMENT. FURTHERMORE, IN ADDITION TO SIMPLY PRESENTING RESULTS, PUBLISHING THE ASSUMPTIONS AND METHODS OF SUCH STUDIES WOULD PERMIT CRITICAL EVALUATION AND COULD HELP ALLAY PUBLIC CONCERNS ABOUT OFFSHORE HAZARDS.

FINALLY, PUBLIC INTEREST ORGANIZATIONS AND LOCAL GOVERNMENTS SHOULD ALSO BE ALERT TO THE OPPORTUNITIES THAT GREATER USE OF THESE FORMAL METHODS OF ANALYSIS MAY PRESENT TO THEM. IF PROPERLY USED, SUCH METHODS OFFER THE HOPE OF BETTER CONTROL OF LOW-PROBABILITY, HIGH-CONSEQUENCE EVENTS OF THE SORT THAT SO OFTEN MOTIVATE OPPOSITION TO OFFSHORE AND OTHER MAJOR PROJECTS. IT IS IMPORTANT FOR SUCH GROUPS TO LEARN HOW RISK ANALYSIS WORKS AND HOW IT IS USED, SO THEY MAY BECOME

INFORMED PARTICIPANTS IN AND CRITICS OF ITS USE.

WE SHOULD REALIZE THAT RISK ANALYSIS IS NOT A PANACEA FOR THE MANAGEMENT OF ANY ASPECT OF OFFSHORE DEVELOPMENT OR SAFETY CONTROL, AND IT SHOULD BE CONSIDERED FOR USE WITH FULL AWARENESS OF ITS STRENGTHS AND LIMITATIONS. THERE APPEARS TO BE LITTLE BASIS FOR IMPOSING A REQUIREMENT ON OPERATORS AND OTHER PARTIES THAT THEY CARRY OUT FORMAL RISK ANALYSIS OF ALL PROJECTS ON A ROUTINE BASIS. INSTEAD, AT THE CURRENT STATE OF THE ART OF THE TECHNIQUE AND OF ITS PRACTICE IN THE UNITED STATES, RISK ANALYSIS IS A TOOL THAT SHOULD BE RESERVED FOR USE IN UNUSUAL CIRCUMSTANCES. IN MOST APPLICATIONS THE USE OF RISK ANALYSIS HAS TENDED TO FOCUS THE ATTENTION OF ANALYSTS AND DECISION MAKERS ON LOW-PROBABILITY, HIGH-CONSEQUENCE EVENTS. BECAUSE RISK ANALYSIS IS ORIENTED TOWARD CATASTROPHIC EVENTS, IT IS UNREASONABLE TO EXPECT THAT IT CAN SUBSTITUTE FOR THE MORE TRADITIONAL TYPES OF SAFETY AND ENVIRONMENTAL MANAGEMENT STUDIES WHICH TEND TO FOCUS ON DAY-TO-DAY EVENTS. BUT THESE TRADITIONAL METHODS ARE INADEQUATE FOR ADDRESSING MOST CATASTROPHIC LOSSES. THUS THE TWO APPROACHES CAN BEST BE VIEWED AS BEING COMPLEMENTARY.

IT SHOULD BE NOTED THAT RISK ANALYSIS IS NOT JUST ANOTHER TECHNIQUE OF ANALYSIS LIKE OTHERS USED BY GOOD ENGINEERS. BECAUSE IT IS BASED ON ANALYSIS OF PROBABILITIES, IT INVOLVES AN ENTIRELY DIFFERENT MIND-SET FROM THE DETERMINISTIC METHODS THAT ARE TRADITIONALLY USED. THE PREREQUISITE TO MAKING EFFECTIVE USE OF RISK ANALYSIS TO HELP REDUCE THE UNDESIREABLE CONSEQUENCES OF OFFSHORE ACTIVITIES IS THE WILLINGNESS TO ACCEPT THE FACT THAT NEARLY ANYTHING CAN HAPPEN AT SOME

LEVEL OF PROBABILITY, BUT THAT NOT ALL SUCH EVENTS ARE EQUALLY PROBABLE OR EQUALLY DAMAGING.

FINALLY, YOU MAY WISH TO CONSIDER MORE FAR-REACHING CHANGES IN THE REGULATORY SYSTEM THAT WOULD TAKE ADVANTAGE OF THE POWER OF FORMAL RISK ANALYSIS. USED PROPERLY, RISK ANALYSIS CAN ALLOW FOR MORE EFFECTIVE REGULATION OF SAFETY AND ENVIRONMENTAL RISKS WHILE ALLOWING INDUSTRY GREATER FLEXIBILITY IN THE SELECTION OF TECHNOLOGY AND OPERATIONAL METHODS, AND WHILE ASSIGNING MORE OF THE RESPONSIBILITY FOR THE EFFECTIVE CONTROL OF HAZARDS TO THE OPERATING COMPANIES. THIS MIGHT BE DONE BY ADAPTING THE SELF-REGULATION APPROACH KNOWN IN NORWAY AS "INTERNAL CONTROL", OR BY REQUIRING THAT OPERATORS ADOPT A FORMAL PROGRAM OF QUALITY ASSURANCE.

UNDER THE SYSTEM OF INTERNAL CONTROL, OPERATORS MUST FULFILL A SET OF OVERALL PROCEDURAL REQUIREMENTS FOR SAFETY MANGEMENT THAT SUBSTITUTE FOR THE ESTABLISHMENT AND OVERSIGHT OF DETAILED DESIGN AND OPERATING RULES BY REGULATORY AUTHORITIES. AS COMPARED WITH MORE TRADITIONAL APPROACHES TO REGULATION, THIS SYSTEM INVOLVES SUBSTANTIALLY LESS DAY-TO-DAY OVERSIGHT OF COMPANY OPERATIONS BY REGULATORY AUTHORITIES WHILE STRENGTHENING THE ACCOUNTABILITY OF OPERATORS FOR THE CONSEQUENCES OF THEIR ACTIVITIES THROUGH FULL PUBLIC DISCLOSURE. CLEARLY, AS WE HAVE HEARD TODAY, THE RAPID INCREASE IN OFFSHORE ACTIVITY EXPECTED IN SANTA BARBARA WILL OVERTAX THE REGULATORY AND EMERGENCY RESPONSE AGENCIES. FEWER REGULATIONS REQUIRE FEWER REGULATORY STAFF THAN ARE NEEDED IF EVERY INSTALLATION IS DIRECTLY SUPERVISED BY GOVERNMENT REPRESENTATIVES. NEVERTHELESS, ALL OFFSHORE DESIGNS AND OPERATIONS

WOULD REMAIN SUBJECT TO RANDOM SPOT CHECKS BY AUTHORITIES.

FORMAL ANALYSIS OF RISK PLAYS A KEY ROLE IN DETERMINING WHETHER A PROPOSED DESIGN IS IN COMPLIANCE WITH THE OVERALL LEVELS OF ACCEPTABLE RISK SET FORTH BY THE REGULATING AGENCY. EFFECTIVE USE OF THE METHOD OF INTERNAL CONTROL REQUIRES THAT A LEVEL OF ACCEPTABLE RISK BE SPECIFIED SO THAT THE OPERATORS CAN SHOW THAT THEY HAVE TAKEN THE STEPS NECESSARY TO DESIGN AN ACCEPTABLE SYSTEM AND OPERATING PLAN. HOWEVER, ESTABLISHING A LEVEL OF ACCEPTABLE RISK HAS PROVEN TO BE QUITE CONTROVERSIAL IN NORWAY FOR OFFSHORE REGULATION AND IN THE U.S. FOR REGULATING SUCH TECHNOLOGIES AS NUCLEAR POWER. WHETHER AN ACCEPTABLE LEVEL OF RISK CAN BE ESTABLISHED FOR OFFSHORE ACTIVITIES IN THE CALIFORNIA COASTAL REGIONS REMAINS TO BE DETERMINED.

IN SUMMARY, THE USE OF RISK ANALYSIS TECHNIQUES AS A TOOL FOR IDENTIFYING AND MITIGATING HAZARDS FROM OFFSHORE OPERATIONS PROVIDES BOTH OPPORTUNITIES AND POTENTIAL PROBLEMS FOR ALL PARTIES CONCERNED WITH THESE ACTIVITIES. INCREASED USE OF THESE TECHNIQUES CAN HELP TO MAKE OFFSHORE OPERATIONS SAFER.

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CALIFORNIA SENATE SUBCOMMITTEE ON
OFFSHORE OIL AND GAS DEVELOPMENT

CLAIR GHYLIN
GENERAL MANAGER
WESTERN REGION LAND DEPARTMENT
CHEVRON U.S.A. INC.

NOVEMBER 4, 1985

Chevron's Point Arguello Project Offshore Central California is a study of struggles and cooperation between industry, local, state and federal government agencies, and public interest groups. These groups have been attempting to resolve the myriad permitting jurisdictional and environmental concerns that have stood in the way of developing California's offshore resources. The permitting and jurisdictional overlaps have been created by a number of single issue federal laws passed in the last two decades, including:

The OCS Lands Act and its amendments

National Environmental Protection Act of 1969

Marine Sanctuaries Act of 1972

Coastal Zone Management Act of 1972

Endangered Species Act of 1973

Clean Water Act as amended in 1977

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As a result of this, at least 8 federal agencies must issue approvals before exploration and production activities can begin.

In addition there are a number of State and Local laws that govern and permits that are required. In fact, the number of agencies involved in either issuing a permit, approval or certification or in reviewing and commenting on OCS activities increases as those activities move from the exploratory phase to the development and production stages. For instance, in California some of the agencies involved in the OCS process are:

In the Exploration Phase, State Agencies include the Office of Planning and Research, Coastal Commission and Local Agencies include County Air Pollution Districts.

But when we get to the Development and Production Phases then State Agencies involved are: Office of Planning and Research, Coastal Commission, State Lands Commission, Air Resources Board, Department of Fish and Game, Department of Parks and Recreation, State Water Resources Control Board, Department of Conservation, Department of Transportation. Local Agencies include County Air Pollution Districts, Regional Water Quality Control Boards, City Planning Departments, Public Works Departments, City and County Fire Departments, and Police Departments.

In 1981 the Comptroller General reported to Congress on the impact of regulations during the exploratory and development phase and made the following findings:

"The Outer Continental Shelf potentially can

PROVIDE THE NATION WITH SIGNIFICANT FUTURE OIL AND GAS RESOURCES. BUT, THE FULL POTENTIAL WILL NOT BE REALIZED UNLESS:

-- VARIOUS FEDERAL AGENCIES INVOLVED ISSUE PERMITS AND COMPLETE OTHER AUTHORIZATION ACTIONS WITHIN A STANDARD, REASONABLE TIME WHICH GAO BELIEVES SHOULD BE A MAXIMUM OF 90 DAYS.

-- COASTAL STATES ARE ENCOURAGED TO DEVELOP PROCESSES FOR LOCAL REVIEWS AND ISSUING PERMITS WHICH ARE MORE TIMELY AND UNIFORM WITH FEDERAL PROCESSES.

-- CREDIBILITY OF THE ENVIRONMENTAL REVIEW PROCESS IS MORE CLEARLY ESTABLISHED TO MINIMIZE CHALLENGES AND DELAYS..."

WE ARE NEARING COMPLETION OF THE PERMITTING

process for our Point Arguello offshore project. The Pt. Arguello project includes Chevron's Platform Hidalgo - 56 slots in 430' of water located 6.5 miles SW of Pt. Arguello - Texaco's Platform Harvest - 50 slots in 670' of water and Chevron's Platform Hermosa - 48 slots - in 602' of water; two subsea pipelines connecting the platforms and then going onshore at Point Conception then on to the processing facilities at Gaviota. This is the first major offshore project to go through the entire permitting process since the GAO 1981 Report to Congress. I think it would be interesting to see how we are doing.

<u>First, Federal permits</u>. The Comptroller General thinks the Federal agencies should complete their authorization within a standard reasonable time--a maximum of 90 days.

In July, 1982, Chevron began formal preparation of Development and Production Plan and Environmental Report (DPP/ER) and Oil Spill and Emergency Contingency Plan and in December, 1982, they were submitted to the Minerals Management Service.

More than 90 days later, in May, 1983, the Plan was deemed complete by the MMS. This is not an APPROVAL by the MMS, but only an acknowledgement that the DPP/ER is ready to be put through several extensive and detailed review processes mandated by the Coastal Zone Management Act, the National Environmental Policy Act, the California Environmental Quality Act and by local coastal plans.

At this time, Chevron began submitting to the MMS for review and approval detailed structural plans and specifications for Platform Hermosa and associated

PIPELINES. THIS IS AN ONGOING PROCESS DONE IN STAGES AT THE DESIGN PHASE, FABRICATION PHASE AND INSTALLATION PHASE. THESE PLANS MUST BE APPROVED BY THE MMS BEFORE PLATFORM HERMOSA CAN BE TRANSPORTED TO THE INSTALLATION SITE. APPROXIMATELY FIFTEEN OTHER PLANS RELATED TO ACTUAL OPERATIONS (SAFETY, COMMUNICATIONS, TRANSPORTATION, TRAINING, ETC.) MUST BE SUBMITTED AND APPROVED BY THE MMS BEFORE OPERATIONS CAN COMMENCE ON THE PLATFORM. FINALLY, A SEPARATE APPLICATION FOR A PERMIT TO DRILL MUST BE FILED WITH THE MMS FOR EACH WELL TO BE DRILLED FROM THE PLATFORM.

OTHER AREAS OF DIRECT INVOLVEMENT WITH THE MMS IN THE PERMITTING PROCESS INCLUDED: APPROVAL OF ROYALTY VALUATION AND PRODUCTION ALLOCATION METHODS, APPROVAL OF PIPELINES' LEAK DETECTION SYSTEM, APPROVAL OF WET OIL AND NATURAL GAS METERING SYSTEMS, ISSUANCE OF

RIGHTS OF WAY FOR PIPELINES ON THE OCS AND APPROVAL OF PLATFORM EVACUATION AND SHELTERING PLANS INVOLVING VANDENBERG MISSLE AND SHUTTLE LAUNCHES.

IN MAY, 1983, THE MMS SENT THE PLAN (DPP/ER) TO THE CALIFORNIA COASTAL COMMISSION FOR CONSISTENCY REVIEW PURSUANT TO THE COASTAL ZONE MANAGEMENT ACT.

AT ABOUT THIS TIME, WE BEGAN PREPARING AND FILING APPLICATIONS FOR PERMITS AND APPROVALS FROM OTHER FEDERAL AGENCIES: CORPS OF ENGINEERS, ENVIRONMENTAL PROTECTION AGENCY, COAST GUARD, FEDERAL AVIATION ADMINISTRATION, FEDERAL COMMUNICATIONS COMMISSION AND THE FEDERAL ENERGY REGULATORY COMMISSION. NONE OF THESE AGENCIES CAN ISSUE THEIR PERMITS AND APPROVALS UNTIL AFTER NEPA/CEQA REVIEW PROCESS IS COMPLETE AND MMS HAS GIVEN FINAL APPROVAL TO THE PLAN (DPP/ER).

IN OCTOBER, 1983, THE 59-WEEK JOINT FEDERAL/STATE

EIS/EIR ENVIRONMENTAL REVIEW OF THE PROJECT PURSUANT TO THE NEPA AND CEQA COMMENCED. THE DOCUMENT WAS PREPARED BY A. D. LITTLE, INC. FOR THE JOINT REVIEW PANEL HEADED BY THE CO-LEAD AGENCIES, THE MMS AND THE COUNTY OF SANTA BARBARA, AND INCLUDING THE CALIFORNIA COASTAL COMMISSION, THE STATE LANDS COMMISSION AND THE GOVERNOR'S OFFICE OF PLANNING AND RESEARCH.

IN OCTOBER, 1984, THE FINAL EIS/EIR WAS CERTIFIED. IN NOVEMBER AND DECEMBER, 1984, AFTER A TOTAL OF TEN PUBLIC HEARINGS, THE PLANNING COMMISSION AND THE BOARD OF SUPERVISORS OF SANTA BARBARA COUNTY APPROVED THE PROJECT, SUBJECT TO OVER 160 CONDITIONS. IN JANUARY, 1985, THE MMS APPROVED THE POINT ARGUELLO FIELD DPP, SUBJECT TO SEVERAL CONDITIONS--<u>OVER TWO YEARS</u> FROM THE DATE THE PLAN (DPP/ER) WAS FIRST SUBMITTED TO THE MMS.

SO MUCH FOR THE 90 DAY PROCESS FOR FEDERAL

AGENCIES.

STATE AND LOCAL PERMITS. AS TO STATE AND LOCAL PERMITS, THE REPORT TO CONGRESS RECOMMENDED "COASTAL STATES ARE ENCOURAGED TO DEVELOP PROCESSES FOR LOCAL REVIEWS AND ISSUING PERMITS WHICH ARE MORE TIMELY AND UNIFORM WITH FEDERAL PROCESSES." WE WERE ABLE TO PURSUE STATE COASTAL COMMISSION AND SANTA BARBARA COUNTY PERMITS SIMULTANEOUSLY WITH THE FEDERAL PERMITS AND A LOT OF TIME WAS SAVED. STILL THE OVERLAP AND DUPLICATION IS BOGGLING.

IN NOVEMBER 1983, THE COASTAL COMMISION GRANTED CONSISTENCY CERTIFICATION FOR THE DEVELOPMENT AND PRODUCTION PLAN FOR THE FIRST PLATFORM. THE PLAN HAD BEEN SUBMITTED TO THE CALIFORNIA COASTAL COMMISSION FOR CONSISTENCY CERTIFICATION BY THE MMS ON MAY 19, 1983. THE COASTAL COMMISSION HELD PUBLIC HEARINGS ON JULY

26TH, AUGUST 2ND, SEPTEMBER 20TH, OCTOBER 25TH AND FINALLY NOVEMBER 15, 1983. THE COMMISSION TOOK 3-DAYS LESS THAN THE FULL 6-MONTHS AUTHORIZED BY THE CZMA TO REVIEW THIS PROJECT.

WITH RESPECT TO PLATFORM HIDALGO, CHEVRON'S 2ND PLATFORM IN THE FIELD, THE PLAN (DPP/ER) WAS TRANSMITTED TO THE COASTAL COMMISSION ON JUNE 29, 1984. IN A SINGLE HEARING, THE COASTAL COMMISSION VOTED CONCURRENCE WITH OUR CONSISTENCY CERTIFICATION. THIS TOOK PLACE ON NOVEMBER 28, 1984.

IN GENERAL, THE COMMISSION FOUND THE PLATFORM HERMOSA PLAN CONSISTENT BECAUSE WE "MITIGATED KNOWN IMPACTS TO THE EXTENT FEASIBLE." THE PRIMARY MITIGATION WAS OUR COMMITMENT TO A PIPELINE TRANSPORTATION SYSTEM FOR CRUDE OIL OUT OF SANTA BARBARA COUNTY. THIS MITIGATION MEASURE TOOK CARE OF

MANY CONCERNS REGARDING 1) TRANPORTATION OF CRUDE OIL; 2) MARINE RESOURCES; 3) COMMERCIAL FISHING; 4) CRUDE OIL SPILLS; 5) VESSEL TRAFFIC SAFETY; 6) AIR QUALITY; 7) VISUAL AND SCENIC RESOURCES; AND 8) PUBLIC WELFARE. ALL OF THE ISSUES RELATED TO THE ALTERNATIVE OF USING TANKERS TO MOVE CRUDE OIL TO REFINERIES. BY SUBSTITUTING A PIPELINE TRANSPORTATION SYSTEM, THE COMMISSION FELT THAT THE ADVERSE IMPACTS ASSOCIATED WITH TANKER USE HAD BEEN MITIGATED.

FOR VESSEL TRAFFIC SAFETY, WE COMMITTED TO THE PLACEMENT OF AN AUTOMATIC RADAR PLOTTING AID ON PLATFORM HERMOSA. THE COST HERE IS NOT SIGNIFICANT, BUT THE OPERATIONAL COST OF MANNING IT 24 HOURS PER DAY, IN ADDITION TO PROBLEMS CREATED BY ITS NOT HAVING BEEN DESIGNED IN THE OPERATIONS ROOM CREATED SUBSTANTIAL DIFFICULTIES IN REFORMATTING THE CONTROLS

FOR THE PLATFORM.

ON THE ISSUE OF THE DISCHARGE OF DRILLING MUDS AND CUTTINGS, WE COMMITTED TO INITIATE A STUDY TO EVALUATE ALL AVAILABLE MEASURES TO MITIGATE THE IMPACT OF THE DISPOSAL OF MUDS AND CUTTINGS. THE COST OF THIS STUDY WAS ESTIMATED TO BE $250,000. ALTHOUGH THE STUDY ITSELF IS NOT "MITIGATION", WE AGREED TO INCORPORATE ANY COST-EFFECTIVE MEASURES IDENTIFIED BY THE STUDY.

TO ADDRESS COMMERCIAL FISHING IMPACTS, WE AGREED TO ROUTE SUPPORT BOATS DIRECTLY SOUTH TO THE 30-FATHOM CURVE BEFORE PROCEEDING WEST TO THE PLATFORM AND PIPELINE. WE ALSO AGREED TO CONDUCT A POST-CONSTRUCTION SURVEY IN THE CONSTRUCTION CORRIDOR FOR THE PIPELINE AND TO REMOVE ANY RETRIEVABLE DEBRIS. THE SURVEY AND RETRIEVAL OF DEBRIS WILL COST IN THE NEIGHBORHOOD OF $50,000.

FOR THE CLEAN-UP OF OIL SPILLS, WE COMMITTED TO ACQUIRE A VESSEL SIMILAR TO MR. CLEAN II AND STATION IT AT OR NEAR THE SITE OF PLATFORM HERMOSA. THIS WILL COST APPROXIMATELY $1.5 MILLION TO $2 MILLION. THIS DOES NOT INCLUDE ANNUAL OPERATING COSTS.

THE WHOLE PERMITTING PROCESS HAS BEEN LONG AND LABORIOUS BUT ALSO ENLIGHTENING AND ENCOURAGING.

THE FIRST FAVORABLE CONSISTENCY DETERMINATION FROM THE COASTAL COMMISSION FOLLOWED 6 MONTHS OF INTENSIVE NEGOTIATIONS WITH THE COASTAL COMMISSION AND ITS STAFF ON 15 MAJOR AREAS OF ENVIRONMENTAL CONCERN.

UNPRECEDENTED SUPPORT IN FAVOR OF THE PROJECT CAME FROM THE CITY OF SANTA BARBARA, THE COUNTY BOARD OF SUPERVISORS, LOCAL MEMBERS OF THE STATE LEGISLATURE, THE STATE ADMINISTRATION, THE DEPARTMENT OF INTERIOR AND ENVIRONMENTAL LEADERS.

We think we won that support through an aggressive program to address all environmental concerns and to keep everyone fully informed about everything that was happening. We believe our negotiations forged a new attitude of good faith - a new climate of cooperation between the oil industry and the many agencies involved on behalf of the public. We think this process has set a standard for development in other areas of critical environmental concern

The County

In August of 1982, Chevron began its first pre-application meetings with Santa Barbara County's Resource Management Department Energy Division staff. Eleven months later, we submitted our County Development Plan Application. It cost us $200,000 to prepare. During that eleven-month period and

CONTINUING THROUGH THIS DATE, WE HAVE BEEN MEETING WITH COMMUNITY LEADERS, LOCAL FISHERMEN AND NATIVE AMERICANS, VISTA DEL MAR SCHOOL BOARD, CITIZEN GROUPS (SUCH AS CITIZENS PLANNING ENVIRONMENTAL DEFENSE CENTER), LOCAL LANDOWNERS, THE REGIONAL WATER QUALITY CONTROL BOARD, COUNTY HEALTH SERVICES DEPARTMENT, COUNTY BUILDING AND SAFETY DEPARTMENT, COUNTY ROADS DEPARTMENT (IN CONJUNCTION WITH OUR MEETINGS WITH CALTRANS FOR OUR PROPOSED OVERPASS), THE LOCAL CALIFORNIA STATE PARK AND RECREATION DEPARTMENT, AND FISH AND GAME.

AFTER OUR APPLICATION WAS DEEMED COMPLETE BY THE COUNTY, IT TRIGGERED A 59-WEEK ENVIRONMENTAL REVIEW PERIOD. THE LAW CALLS FOR A 52-WEEK REVIEW PERIOD; HOWEVER, CHEVRON CONSENTED TO AN ADDITIONAL SEVEN-WEEK EXTENSION TO ALLOW FOR BOTH THE PUBLIC AND THE COUNTY

TO HAVE MORE TIME TO REVIEW OUR PROJECT. DURING THIS 59-WEEK REVIEW PERIOD, CHEVRON (AND ITS PARTNERS) FUNDED A JOINT CEQA/NEPA ENVIRONMENTAL ANALYSIS WHICH COST IN EXCESS OF $3 MILLION. ADMINISTRATIVE COSTS FOR THE COUNTY OF SANTA BARBARA AND OTHER AGENCIES WERE FUNDED BY CHEVRON IN AN AMOUNT THAT EXCEEDED $350,000.

TWO SCOPING HEARINGS WERE HELD IN NOVEMBER, 1983 - ONE IN SANTA MARIA AND ONE IN SANTA BARBARA. THE PURPOSE OF THESE HEARINGS WAS TO ACCEPT PUBLIC TESTIMONY REGARDING THE SCOPE OF THE PROPOSED EIR/EIS FOR THE PROJECT. IN JULY 1984, SANTA BARBARA COUNTY CONDUCTED HEARINGS TO RECEIVE COMMENTS ON THE DRAFT EIR/EIS AND IN OCTOBER THEY CONDUCTED HEARINGS FOR THE CERTIFICATION OF THE DOCUMENT. THE SANTA BARBARA PLANNING COMMISSION CONDUCTED SIX PUBLIC HEARINGS FROM NOVEMBER 8 THROUGH DECEMBER 6, 1984. AT THE CONCLUSION

OF THESE HEARINGS, THE COUNTY BOARD OF SUPERVISORS CONDUCTED FOUR PUBLIC HEARINGS OF ITS OWN IN SLIGHTLY OVER TWO WEEKS. FOLLOWING THOSE HEARINGS, DURING WHICH THE PUBLIC PARTICIPATED FULLY AND FREELY, THE BOARD OF SUPERVISORS APPROVED THE PROJECT ON DECEMBER 18, 1984. THE PROJECT APPROVAL CARRIED WITH IT OVER 160 PERMIT CONDITIONS WHICH COULD ADD AN ADDITIONAL $22 MILLION TO THE PROJECT COST.

TWO SEPARATE APPEALS OF THE CHEVRON PROJECT HAVE BEEN FILED WITH THE COASTAL COMMISSION, THE APPEAL BY GOO AND THE ENVIRONMENTAL DEFENSE CENTER RAISE MANY OF THE SAME ENVIRONMENTAL ISSUES ANEW AND IT BASICALLY ALLEGES THAT THE ENVIRONMENTAL ANALYSIS WAS INCOMPLETE, INADEQUATE AND TOO SHORT. THE COASTAL COMMISSION REJECTED BOTH APPEALS ON APRIL 9, 1985.

TWO LAWSUITS HAVE BEEN FILED AGAINST THE COUNTY -

SIMILAR SUITS BY LANDOWNERS NEAR THE ONSHORE PIPELINE ROUTE. THE SUITS ALLEGE THE ENVIRONMENTAL ANALYSIS IS INADEQUATE, TOO BULKY AND TOO LONG. WE ARE STILL WAITING FOR A JUDGE TO BE ASSIGNED. THE ENTIRE SANTA BARBARA COUNTY SUPERIOR COURT BENCH DISQUALIFIED ITSELF BECAUSE ONE MEMBER (JUDGE LLEWELLYN) HAS A PARTIAL OWNERSHIP INTEREST IN ONE OF THE PARCELS IN THE HOLLISTER RANCH.

TWO MONTHS AGO THE ENVIRONMENTAL DEFENSE CENTER, ON BEHALF OF THE LOS PADRES CHAPTER OF THE SIERRA CLUB FILED SUIT CHALLENGING THE COASTAL DEVELOPMENT PLAN ALLEGING THAT GRADING OPERATIONS WOULD DESTROY SOME EUCALYPTUS TREES WHICH ARE SEASONAL HOMES FOR MONARCH BUTTERFLIES. A SANTA BARBARA COUNTY JUDGE HAS BEEN ASSIGNED THE CASE. THE SIERRA CLUB REQUESTED A TEMPORARY RETRAINING ORDER WHICH THE COURT DENIED ON

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August 13, 1985. Further motions are scheduled for late October with the trial expected in mid-1986.

Credibility of the Process. The Comptroller General's report concluded by recommending that the credibility of the environmental review process be more clearly established to minimize challenges and delays. And that's where we are today in the Point Arguello process. Just when it looked most like the process really worked 7 lawsuits wepe filed - 2 appeals from the County decision were filed and petitions began circulating to place a planning initiative on the ballot for the fall election to override some of the County Board of Supervisors oil decisions.

The initiative would take the entire group of environmental agreements which have been painfully worked out between the industry and local government

AND SIMPLY DISMISS THEM AS BEING INADEQUATE. THE INITIATIVE IS SUPPORTED BY A GROUP CALLED CONCERNED ABOUT OIL. IT WOULD DESIGNATE LAS FLORES CANYON AS THE ONLY SITE IN THE SOUTH COUNTY FOR AN OIL PROCESSING FACILITY, HALTING CHEVRON'S PLANS FOR THE GAVIOTA STORAGE AND TREATMENT FACILITY.

A NORTH COUNTY PROCESSING SITE WOULD BE SELECTED IN THE FUTURE BY THE COUNTY BOARD OF SUPERVISORS.

THE INITATIVE WOULD REQUIRE THAT OIL PRODUCERS TRANSPORT CRUDE OUT OF THE COUNTY BY PIPELINE RATHER THAN BY MARINE TANKERS ONCE THE PIPELINES ARE IN PLACE. IT WOULD ALLOW ONLY ONE NEW CONSOLIDATED TANKER-LOADING TERMINAL AND WOULD RESTRICT THE EXPANSION OF EXISTING TERMINALS AND PROCESSING PLANTS.

IF THE INITATIVE PASSES ITS CONDITIONS COULD BE CHANGED ONLY BY A UNANIMOUS OR 4-1 VOTE OF THE

SUPERVISORS OR BY ANOTHER BALLOT VOTE.

AND THEREIN LIES THE GREATEST DANGER TO THIS ENTIRE PERMITTING PROCESS. FOR IF IT IS THE CASE THAT THIS PROCESS OF ENVIRONMENTAL ANALYSIS LASTING OVER 5 YEARS, COSTING MILLIONS AND MILLIONS OF DOLLARS, INVOLVING HUNDREDS OF HOURS OF PUBLIC TESTIMONY AND PARTICIPATION, RESULTING IN 18 AGENCIES IMPOSING 200 CONDITIONS DESIGNED TO PROTECT ENVIRONMENTAL CONCERNS - IF IT IS THE CASE - THAT ALL OF THAT HAS NO MEANING BUT THAT THE DECISION WILL BE MADE BY A POPULAR VOTE IN A SPECIFIC LOCAL COMMUNITY - THEN THEY'RE CLEARLY IS NO SUBSTANTIVE ROLE FOR THE GOVERNMENTAL PLANNERS AND REGULATORS OR THE PUBLIC INTEREST REPRESENTATIVES IN THE PROCESS.

ANY APPLICANT WOULD BE WELL ADVISED TO IGNORE THE ENTIRE PROCESS AND IMMEDIATELY SEEK APPROVAL THROUGH A

POPULAR VOTE REFERENDUM.

IF, HOWEVER, WE THINK THAT WE HAVE FORGED A CUMBERSOME BUT WORKABLE PERMITTING PROCESS WHICH IS DESIGNED TO MAXIMIZE ENVIRONMENTAL PROTECTION, THEN I THINK THE REGULATORS AND THE ENVIRONMENTALISTS MUST JOIN WITH US IN WORKING TO SUPPORT THE CREDIBILITY OF THE ENVIRONMENTAL REVIEW PROCESS AND DEFEAT CHALLENGES TO THE PROCESS.

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Statement of Robert Sollen before the California State Senate Subcommittee on Oil and Gas Development, November 4, 1985, at the University of California at Santa Barbara.

This subcommittee hearing comes at an appropriate time as the oil industry plans the biggest offshore development this nation has seen since the North Slope. Even that oil adds to Santa Barbara's problems as tankers from Alaska carry North Slope oil through the Santa Barbara Channel.

As we have heard today, the state can help assure safe and clean oil operations in this area.

Santa Barbara County has experienced three offshore oil booms in the last century, and now faces its fourth, by far the largest. The three earlier ones ended in coastal disaster.

Nearly a century ago oil production began from wooden piers off Summerland's shores amid protest by residents about the degradation of the beaches. When that boom ended in the late 1920s, the oil companies walked off and left their unsightly mess to rot and to rust. It was still being cleaned up at public expense in the 1960s.

After a similar offshore boom off Ellwood in the 1930s and 40s, the oil industry again left that beautiful waterfront in a shambles. Again, the cleanup at public expense continued through the late 1970s, and I'm told that some jagged, rusting pilings still emerge today at low tide.

The third boom started in the late 1950s and ended in 1969 with the great blowout in the Santa Barbara Channel. That was in federal waters beyond state control. But there are two platforms from that era that have stood idle for many years in state waters.

I have asked state Lands Commission officials repeatedly how long a platform may stand idle before it is required to be removed, and what action the commission intends to take on these platforms. The answers are always evasive.

The oil industry has resisted removing platforms that are no longer in production because it is a costly operation. One platform has been removed with great reluctance from state waters in the channel. The Interior Department and the oil industry have discussed rule changes permitting platforms to remain in place after production ends.

Looking at offshore oil development in the long view, therefore, one recommendation is a specific requirement for prompt removal of all coastal and offshore equipment no longer in use.

As for active offshore operations, monitoring is difficult because the vessels and structures are not easily accessible. Regulatory agencies rely heavily on the oil industry to monitor its own operations, conduct its own inspections, report its own violations, enforce public rules for safe and clean operations, and even conduct environmental research for the public agencies.

Enforcement that relies heavily on the regulated industry and its sponsoring agency does not inspire confidence.

There are many state, local and federal agencies responsible for permitting, patrolling, policing, monitoring, inspecting and enforcing regulations in the offshore area. Their jurisdictions do not not coincide, but they overlap.

Each would need a small navy or coast guard of its own to do its job. None has the resources for such a force.

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Consequently, I make an audacious proposal for a joint powers arrangement in which all agencies involved would operate a single enforcement fleet in this areas where it is so sorely needed. Each agency would fund part of the operation, and the oil industry would be assessed for a substantial part of the cost.

The fleet would consist of two large, fast and powerful vessels equipped to fight fires, conduct rescue missions, monitor air and water pollution and run down tankers that are trailing flushed oil. The vessels would have landing pads for a helicopter that would also be part of the system.

Finally, the vessels would carry a sophisticated submersible with space for a pilot and observer-photographer to examine ocean-bottom emergencies and long-term developments associated with the oil industry or other sources of environmental impacts.

As it stands, no public agencies must charter planes, ships, submersibles and crews to conduct any monitoring beyond what is done by the oil industry. This requires consideration of the cost and often causes substantial delays before going into action--or inaction.

If the agencies had the vessels, the crews, the fuel and the equipment on hand, immediate response could be assured for inspection and rescue.

I would not propose this for the entire American coastline. But the special requirements of this area have been acknowledged by the EPA, the MMS, the Congress, state agencies, Santa Barbara and adjoining coastal counties, and by the industry itself. But there is presently no way to deal with potential emergencies or to conduct the essential environmental monitoring. It is not

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enough to rely on the sampling reports of the industry being regulated, nor the surface vessels and aircraft of the Coast Guard which are grossly inadequate for the task.

In addition to this outrageous proposal, I suggest these steps also be taken:

1. A restructuring of the state Lands Commission. It should be an appointed rather than an ex-officio body. The lieutenant governor, controller and finance director often are not sufficiently interested in the commission to give it the necessary attention, and the real authority consequently resides in the staff.

Moreover, the commission should not promote and at the same time regulate offshore oil development. James F. Trout, the commission's executive officer, said here last Wednesday that the commission seeks to maximize oil development in state waters off Santa Barbara County. An agency with such a role is not the appropriate body to conduct environmental impact studies, supervise offshore oil operations and enforce environmental and safety regulations. On the federal level, the Interior Department's Minerals Mangement Service operates under a similar conflict of interest.

2. The state attorney general's office should be provided the resources to assist counties in enforcing conditions placed on coastal oil industry operations.County counsel staffs, however competent, usually lack the resources to cope with the legal resources of some of the world's largest corporations.

3. Coastal counties should be provided with greater opportunity to participate in state and federal inspection and monitoring of offshore oil activities.

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4. Frequent periodic public reports should be required of malfunctions, violations and accidents on offshore oil structures and vessels.

5. Oil transportation in barges should be prohibited. Barges in tow are not in sufficient control, and barge accidents are frequent. Last December a loaded oil barge broke loose in a storm in the Santa Barbara Channel, and was not brought under control for 16 hours. Miraculously, it did not go ashore and break up.

In summary, I strongly urge controls more stringent than those now in place, facilities far beyond those now available, and enforcement by agencies not engaged in promoting oil development. These steps are now needed to avoid major accidents and violations if possible, and to cope with the consequences when and if major mishaps do occur.

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TESTIMONY OF THE

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

BEFORE THE SENATE SUBCOMMITTEE

ON OFFSHORE OIL

NOVEMBER 4, 1985

MR. CHAIRMAN, MEMBERS OF THE SUBCOMMITTEE, I AM COUNCILMEMBER ARCHIE SNOW OF REDONDO BEACH. I AM SPEAKING TODAY AS A MEMBER OF THE EXECUTIVE COMMITTEE OF THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS, AND A MEMBER OF THE L.A. COUNTY EMERGENCY PREPAREDNESS COMMISSION. SCAG'S EXECUTIVE COMMITTEE CONSISTS OF LOCALLY ELECTED OFFICIALS WHO SERVE AS POLICY MAKERS ON REGIONAL ISSUES AFFECTING OUR SIX-COUNTY REGION. AS THE METROPOLITAN PLANNING ORGANIZATION (MPO) FOR THE AREA, SCAG IS RESPONSIBLE FOR THE DEVELOPMENT OF THE AIR QUALITY MANAGEMENT PLAN (AQMP), THE REGIONAL TRANSPORTATION PLAN (RTP) AND ACTS AS THE AREAWIDE CLEARINGHOUSE FOR THE REGION. WITH THIS TYPE OF ENVIRONMENTAL AND TRANSPORTATION BACKGROUND, SCAG IS VITALLY CONCERNED WITH OUTER-CONTINENTAL SHELF (OCS) OIL DEVELOPMENT. THIS CONCERN INCLUDES THE ASPECTS OF RISK MANAGEMENT BEING DISCUSSED AT THIS HEARING TODAY.

WHILE THE MAIN FOCUS OF THE HEARING TODAY IS ON THE DRILLING OF CRUDE IN THE SANTA BARBARA AREA, I WOULD LIKE TO FOCUS ON THE TRANSPORTING OF THIS OIL, BY PIPELINE, TO THE LOS ANGELES METROPOLITAN AREA. SCAG BELIEVES THAT THERE ARE SIGNIFICANT RISK FACTORS ASSOCIATED WITH TRANSPORTING THE CRUDE BY PIPELINE. THESE FACTORS CANNOT AND MUST NOT BE IGNORED.

HANDLING OCS CRUDE

TRANSPORTATION OF SANTA BARBARA'S HEAVY CRUDE OIL REQUIRES EITHER BLENDING OF THE OIL WITH OTHER MATERIALS, SUCH AS NATURAL GAS LIQUIDS (NGL), OR THE HEATING OF THE OIL, SO THAT IT WILL FLOW MORE EASILY THROUGH THE PIPELINE. SANTA BARBARA COUNTY IS REQUIRING THAT THIS BLENDING WITH NGL BE DONE IN THE PROPOSED SOUTHERN CALIFORNIA PIPELINE SYSTEM (KNOWN AS THE ANGELES PIPELINE). WE BELIEVE THIS PROCESS PRESENTS A POTENTIALLY SERIOUS PUBLIC SAFETY HAZARD. NGLS ARE HIGHLY VOLATILE, AND ANY PIPELINE BREAKAGE COULD LEAD TO A CRITICAL INCIDENT. WE ARE VERY CONCERNED THAT THE POTENTIAL RISKS OF FIRES AND EXPLOSIONS BE DISCUSSED AND PLANNED FOR EARLY IN THE DESIGN PROCESS. FOR EXAMPLE, THE ANGELES PIPELINE, A NEW SEGMENT OF THE SOUTHERN CALIFORNIA PIPELINE SYSTEM, WILL BE 130 MILES LONG AND WILL PASS THROUGH 12 CITIES AND 18 MILES OF UNINCORPORATED COUNTY AREAS. THIS PIPELINE MUST BE STRUCTURALLY SOUND. AND CONSIDERATION MUST BE GIVEN FOR THE PARTICULAR RISKS FACED IN DENSELY POPULATED AREAS ALONG THE PROPOSED ROUTE.

POTENTIAL EARTHQUAKE THREAT

THE MAIN REASON THAT THE BLENDING OF CRUDE OIL WITH NGL IS SUCH A CONCERN HERE IN SOUTHERN CALIFORNIA IS THE POTENTIAL FOR A MAJOR EARTHQUAKE. IN AN ANALYSIS PREPARED FOR THE GOVERNOR'S EMERGENCY TASK FORCE ON EARTHQUAKE PREPAREDNESS, A SCENARIO WAS DEVELOPED BASED ON AN EARTHQUAKE OF 8.3 IN MAGNITUDE. THAT REPORT INDICATED THAT IN THE EVENT OF SUCH A QUAKE, PIPELINE FACILITIES WOULD PROBABLY SUSTAIN VARYING DEGREES OF DAMAGE DEPENDING ON THE PROXIMITY TO THE ACTUAL FAULT LINE AND THE STABILITY OF

THE GROUND ON WHICH THEY ARE BUILT. PIPELINES COMING FROM KERN COUNTY TO LOS ANGELES WOULD CROSS THE SAN ANDREAS FAULT IN THE TEJON PASS REGION. AS I INDICATED EARLIER, THE BEST POSSIBLE MEANS OF MANAGING THE RISKS ASSOCIATED WITH PIPELINE DEVELOPMENT IS TO DEVELOP A VERY THOROUGH PLANNING AND ENVIRONMENTAL IMPACT REVIEW PROCESS. ONLY IN THIS WAY WILL THE POSSIBLE RISKS OF PIPELINE BREAKAGE BE KEPT TO A MINIMUM.

ENVIRONMENTAL IMPACT REPORTING PROCESS

MY THIRD POINT RELATES TO THE NEED TO ADEQUATELY STUDY AND DEFINE ALL THE FACTORS ASSOCIATED WITH POTENTIAL PIPELINE DEVELOPMENT. I RAISE THIS ISSUE BECAUSE SCAG'S EXPERIENCE WITH OCS ENVIRONMENTAL IMPACT REPORTS (EIR) HAS NOT BEEN A POSITIVE ONE. SCAG DOES NOT BELIEVE THAT EIR'S TO DATE, AND THIS INCLUDES THE SOON TO-BE-COMPLETED PAC-TEX EIR, ACCURATELY PROVIDE EITHER THE FULL INFORMATION OR PROPER FRAMEWORK FOR THE DISCUSSION THAT IS NECESSARY FOR OUR REGION TO UNDERSTAND THE IMPACTS AND COMMENT ON THEM IN A MEANINGFUL WAY. ONE OF OUR BIGGEST PROBLEMS IS THE AMBIGUOUS LANGUAGE USED IN MANY OF THE DOCUMENTS, I.E. "BEST AVAILABLE CONTROL TECHNOLOGY."

ON RISK MANAGMEMENT ISSUES, THE STATE SHOULD TAKE THE LEAD ROLE TO IDENTIFY AND UTILIZE THE SKILLS OF RECOGNIZED WORLD-WIDE EXPERTS IN THE FIELD OF SEISMIC SAFETY AS IT RELATES TO PETROLEUM PIPELINES. IN THIS WAY, ADEQUATE MITIGATION MEASURES IN HIGH RISK AREAS CAN BE TAKEN.

CONCLUSIONS

IN CLOSING, LET ME BRIEFLY ADDRESS THE INTERGOVERNMENTAL IMPLICATIONS OF PIPELINE RISK MANAGEMENT. UNLIKE OFFSHORE INCIDENTS, IT IS CLEAR THAT IN THE CASE OF A PIPELINE ACCIDENT, INDIVIDUAL CITIES OR COUNTIES WOULD HAVE THE LEAD ROLE. HOWEVER, THIS SITUATION APPEARS TO BE VERY MUCH LIKE THE EXAMPLES AND EXPERIENCES OF HAZARDOUS MATERIALS MANAGEMENT. PROPER REGULATION, AWARENESS AND GOOD, QUICK COMMUNICATION ARE THE KEYS TO IMMEDIATE AND SUCCESSFUL ACTION.

CITIES MUST WORK TOGETHER ALMOST AS A "PIPELINE MANAGEMENT NETWORK," SHARING INFORMATION, PREPARING EMERGENCY MANAGEMENT TEAMS OF FIREFIGHTERS, AND COORDINATING WITH THE OIL COMPANIES AND STATE OFFICIALS. JUST AS BEEN DONE HAZARDOUS MATERIALS MANAGEMENT, I WOULD URGE YOU TO INITIATE ACTION IN THE LEGISLATURE THAT WOULD ENHANCE LOCAL GOVERNMENTS ABILITY TO COORDINATE SHOULD ADDITIONAL PIPELINES ACTUALLY BE CONSTRUCTED. IN MY TESTIMONY BEFORE YOUR COMMITTEE IN SACRAMENTO, AND THE MINERAL MANAGEMENT SERVICES REGIONAL TECHNICAL COMMITTEE I HAVE FORWARDED ONE IDEA IN THIS REGARD. I HAVE REPEATED STATEMENTS TO THE EFFECT THAT THE MMS AND STATE GOVERNMENT SHOULD FUND LOCAL JURISDICTIONS TO REVIEW AND COMMENT ON EIR'S RELATING TO OCS OIL PRODUCTION AND ONSHORE TRANSPORTATION AND REFINING PROCESSES.

THANK YOU FOR THE OPPORTUNITY TO SPEAK AT THIS HEARING. I WOULD BE VERY HAPPY TO ANSWER ANY QUESTIONS.